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REPORT NUMBER: 2011-VER-03-04

**SAFETY COMPLIANCE TESTING FOR FMVSS 201
OCCUPANT PROTECTION IN INTERIOR IMPACT
UPPER INTERIOR HEAD IMPACT PROTECTION**

**DAIMLER CHRYSLER CORPORATION
2003 JEEP LIBERTY 4-DOOR**

NHTSA NUMBER: C30302

VERIDIAN TEST NUMBER: 8653-FMH-09

VERIDIAN ENGINEERING
TRANSPORTATION SCIENCES CENTER
P.O. BOX 400
BUFFALO, NEW YORK 14225



Date: January 29, 2003

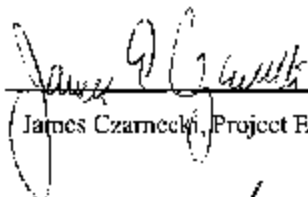
FINAL REPORT

PREPARED FOR:

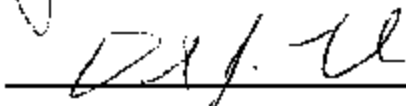
U. S. DEPARTMENT OF TRANSPORTATION
National Highway Traffic Safety Administration
Safety Assurance
Office of Vehicle Safety Compliance
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Prepared by:


James Czarniecki, Project Engineer

Approved by:


David J. Travale, Program Manager
Transportation Science Center

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16. <i>Abstract</i> Compliance tests were conducted on the subject vehicle, a 2003 Jeep Liberty 4-door in accordance with the specifications of the Office of Vehicle Safety Compliance Test Procedure TP-201U-01 for determination of FMVSS 201 compliance. Test failures identified were as follows: Passenger Side AP1 - 1077.8					
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SECTION I

PURPOSE AND TEST PROCEDURE

This head impact compliance test is part of the FMVSS 201 Upper Interior Head Impact Protection Test Program sponsored by the National Highway Traffic Safety Administration (NHTSA) under Contract No. DTNH22-99-C-01005. The purpose of this head impact compliance test was to determine whether the subject vehicle, 2003 Jeep Liberty 4-door, NHTSA No. C30302, meets the performance requirements of FMVSS 201, Occupant Protection in Interior Impact. The compliance test was conducted using the requirements found in the OVSC Laboratory Test Procedure No. TP-201U-01 dated April 3, 1998.

SECTION 2

SUMMARY OF UPPER INTERIOR HEAD IMPACTS

A 2003 Jeep Liberty 4-door, NHTSA No. C30302, was impacted at various locations throughout its upper interior by a 4.54 kg 50th percentile headform. A total of ten (10) impacts were performed in this test series. The target area impacts were chosen by the NHTSA Contracting Officers Technical Representative (COTR). A summary of test results can be found on data sheet 2-1. The ten (10) area chosen for testing were:

AP1	BP1	SR2A	OP1	URBP
AP3	BP3	SR3B		URRP
	BP4			

The selected impact areas on the test vehicle appeared to comply with the performance requirements of FMVSS 201.

Five Free Motion Headforms (FMH), were used in this test series. All five FMH's were calibrated prior to and after the test series. Calibration information are included in Appendix B. Each FMH weighed 4.54 ± 0.5 kg, and had orthogonal tri-axis accelerometer pack mounted at the center of gravity (c.g.).

A total of three (3) channels of data for each target impact test was recorded on a Keyser Threde data acquisition system. Data plots along with still photographs can be found in Section 3 of this report.

To document each target area impact test, one Kodak Ektapro high speed video camera was to record the headform contact with the selected target area.

DATA SHEET 2-1

SUMMARY OF UPPER INTERIOR HEAD IMPACT TESTS

Year/Make/Model/Body Style:	2003 Jeep Liberty 4-door		
Vehicle Body Color:	Red	VTN:	1J4GH48183W539150
Vehicle NHTSA No.:	C30302	Month & Year of Manufacture: 9/2002	

Test No.	Code	Target			Approach Angles (degrees)		Velocity (kph)	FMH HIC	HIC(d)*
		X (mm)	Y (mm)	Z (mm)	Horizontal	Vertical			
1	AP3	2694	595	2015	137	37	23.49	260.1	362.6
2	BP4	3422	680	1918	136	-9	23.72	683.6	682.2
3	BP1	3376	503	2284	90	28	23.56	655.5	660.9
4	AP1	2864	579	2184	150	39	23.53	1208.0	1077.8
5	SR2A	3161	491	2281	90	33	23.45	776.8	752.8
6	URRP	4544	415	2353	50	25	23.46	178.7	301.2
7	OP1	4100	-607	2021	270	0	23.39	563.8	591.8
8	SR3B	3754	-454	2280	270	50	23.60	327.7	413.5
9	BP3	3320	-650	2040	272	-9	23.63	579.8	603.8
10	URBP	3377	-405	2328	270	45	23.80	1041.3	952.0

Note : Origin of coordinate system is the front center of the vehicle bumper using Daimler's reference coordinate's (door striker lower hole : x= 3282.41mm , y=755.95mm , z=1449.57mm)

*HIC(d) 0.75446(Free Motion Headform HIC)=- 66.4

DATA SHEET 2-2

TEST RESULTS SUMMARY TABLE

Year/Make/Model/Body Style: 2003 Jeep Liberty 4-door
 Vehicle Body Color: Red VIN: 1J4GL48183WS39150
 Vehicle NHTSA No.: C30302 Month & Year of Manufacture: 9/2002

Target (mm)				Horizontal Impact angle	Vertical Impact Angle	Velocity (KPH)	FMV-HIC	HIC(d)
	X	Y	Z					
A-PILLAR DRIVER SIDE								
AP1	2865	-577	2186	-	-		-	-
AP2	2764	-579	2100	-	-	-	-	-
AP3	2696	-601	2018	-	-	-	-	-
A-PILLAR PASSENGER SIDE								
AP1	2864	579	2184	150	39	23.53	1208.0	1077.8
AP2	2766	572	2096	-	-	-	-	-
AP3	2694	595	2015	137	37	23.49	260.1	362.6
B-PILLAR DRIVER SIDE								
BP1	3377	-493	2281	-	-	-	-	-
BP2	3363	-609	2042	-	-	-	-	-
BP3	3320	-650	2040	272	-9	23.63	579.8	603.8
BP4	3420	-678	1917	-	-	-	-	-
B-PILLAR PASSENGER SIDE								
BP1	3376	503	2284	90	28	23.56	655.5	660.9
BP2	3367	609	2066	-	-	-	-	-
BP3	3318	657	2033	-	-	-	-	-
BP4	3422	680	1918	136	-9	23.72	683.6	682.2
OTHER PILLARS DRIVER SIDE								
OP1	4190	-607	2021	270	0	23.39	563.8	591.8
OP2	4204	-637	2059	R=2		-	-	-
Rel. OP2	4190	-607	2021	-	-	-	-	-
OTHER PILLARS PASSENGER SIDE								
OP1	4199	618	2024	-	-	-	-	-
OP2	4191	646	2061	R=2		-	-	-
Rel. OP2	4199	618	2024	-	-	-	-	-

Note R=1 - Relocated once (one sphere) R=2 - Relocated twice (two spheres)

Target (mm)				Horizontal Impact angle	Vertical Impact Angle	Velocity (KPH)	FME-HIC	EIC(d)
	X	Y	Z					
FRONT HEADER DRIVER SIDE								
FH1	2779	-469	2223	R=1		-	-	-
Rel. FH1	2766	-450	2216	-	-	-	-	-
FH2	2755	-315	2221	-	-	-	-	-
FRONT HEADER PASSENGER SIDE								
FH1	2776	474	2225	R=1		-	-	-
Rel. FH1	2763	459	2220	-	-	-	-	-
FH2	2758	325	2222	-	-	-	-	-
SIDE RAIL DRIVER SIDE								
SR1	3014	-509	2244	-	-	-	-	-
SR2A	3168	-497	2268	-	-	-	-	-
SR2B	3076	-502	2259	-	-	-	-	-
SR3	3754	-454	2280	270	50	23.60	327.7	413.6
SIDE RAIL PASSENGER SIDE								
SR1	3011	497	2257	R=1		-	-	-
Rel. SR1	3016	515	2248	-	-	-	-	-
SR2A	3161	491	2281	90	33	23.45	776.8	752.8
SR2B	3075	489	2276	-	-	-	-	-
SR3	3765	465	2287	-	-	-	-	-
UPPER ROOF DRIVER SIDE								
URBP	3377	-405	2328	270	45	23.80	1041.3	952.0
UPPER ROOF PASSENGER SIDE								
URRP	4544	415	2353	50	25	23.46	178.7	301.2

Note R-1 - Relocated once (one sphere) R-2 - Relocated twice (two spheres)

DATA SHEET 2-3

GENERAL TEST AND VEHICLE PARAMETER DATA

TEST VEHICLE INFORMATION:

Year/Make/Model/Body Style: 2003 Jeep Liberty 4-door

Vehicle Body Color: Red VIN: 1J4GL48183W539150

Vehicle NHTSA No.: C30302 Month & Year of Manufacture: 9/2002

Engine Data: 4 Cylinders: - CID: 2.4 Liters: - cc

Engine Placement: x Longitudinal; or - Lateral

Transmission: 5 Speed; x Manual; - Automatic, - Overdrive

Final Drive: - Rear Wheel Drive; - Front Wheel Drive; x Four Wheel

Odometer Reading 102 km

Options: x A/C; x Power Steering; x Pwr.Brakes; x Pwr. Windows

Interior Trim Information :

1. Grab handles on both A-pillars and on both outboard rear seat occupant side rails.
2. Adjustable D-rings on both B-pillars.
3. Non-adjustable D-rings on both Other Pillars.

DATA FROM TIRE PLACARD

Tire Pressure (at capacity): 227 kPa FRONT

227 kPa REAR

Recommended Tire Size: P215/75R16

Tires on Test Vehicle: P215/75R16 ; Manufacturer: Goodyear

Vehicle Capacity Data:

Number of Occupants: 2 Front, 3 Rear; - 3rd Seat; 5 Total

Type of Front Seats: x Bucket; - Bench, - Split Bench

Type of Front Seat Back: - Fixed; x Adjustable with x Lever or - Knob

Vehicle Capacity Weight (VCW) 522 kg (A)

No. of Occupants x 68 kg. - 340 kg (B)

Rated Cargo/Luggage Weight (RCLW) = 182 kg (A-B) Max. RCLW 136 kg.

TEST VEHICLE DELIVERED WEIGHT WITH MAXIMUM FLUIDS:

Left Front	=	<u>470</u> kg	Left Rear	=	<u>433.5</u> kg
Right Front	=	<u>444.5</u> kg	Right Rear	=	<u>409.5</u> kg
TOTAL FRONT		<u>914.5</u> kg	TOTAL REAR	=	<u>843.0</u> kg
% of Total Weight	=	<u>52.0</u> %	% of Total Weight	=	<u>48.0</u> %
TOTAL WEIGHT	=	<u>1757.5</u> kg			

CALCULATION OF VEHICLE'S TARGET TEST WEIGHT:

Total Test Vehicle Delivered Weight	=	<u>1757.5</u> kg
+ Rated Cargo/Luggage Weight	=	<u>136.0</u> kg
TEST VEHICLE TARGET WEIGHT:	=	<u>1893.5</u> kg

WEIGHT OF TEST VEHICLE (FULLY LOADED):

Left Front	=	<u>453</u>	kg	Left Rear	=	<u>505</u>	kg
Right Front	=	<u>446</u>	kg	Right Rear	=	<u>485</u>	kg
TOTAL FRONT		<u>899.0</u>	kg	TOTAL REAR	=	<u>990.0</u>	kg
% of Total Weight	=	<u>47.6</u>	%	% of Total Weight	=	<u>52.4</u>	%
TOTAL TEST WEIGHT	=	<u>1889.0</u>	kg				

Weight of vehicle secured in test vehicle's cargo area = 130 kg.

TEST VEHICLE ATTITUDE (all dimensions in millimeters):**AS DELIVERED:**

Left Front	<u>854</u>	Right Front	<u>861</u>	Left Rear	<u>845</u>	Right Rear	<u>855</u>
------------	------------	-------------	------------	-----------	------------	------------	------------

FULLY LOADED:

Left Front	<u>854</u>	Right Front	<u>859</u>	Left Rear	<u>821</u>	Right Rear	<u>831</u>
------------	------------	-------------	------------	-----------	------------	------------	------------

Test Vehicle Wheelbase: 2640 millimeters

TEST VEHICLE PITCH AND ROLL ANGLES:**AS DELIVERED:****PITCH ANGLES**

Left Door Sill	<u>0.1 °</u>	Right Door Sill	<u>0.1 °</u>
----------------	--------------	-----------------	--------------

ROLL ANGLES

Front Bumper	<u>0.4 °</u>	Rear Bumper	<u>0.7 °</u>
--------------	--------------	-------------	--------------

FULLY LOADED:**PITCH ANGLES**

Left Door Sill	<u>0.6 °</u>	Right Door Sill	<u>0.5 °</u>
----------------	--------------	-----------------	--------------

ROLL ANGLES

Front Bumper	<u>0.4 °</u>	Rear Bumper	<u>0.8 °</u>
--------------	--------------	-------------	--------------

AS TESTED:**PITCH ANGLES**

Left Door Sill	<u>0.3 °</u>	Right Door Sill	<u>0.3 °</u>
----------------	--------------	-----------------	--------------

ROLL ANGLES

Front Bumper	<u>0.4 °</u>	Rear Bumper	<u>0.7 °</u>
--------------	--------------	-------------	--------------

DATA SHEET 2-4
TARGET MEASUREMENT REFERENCE SHEET

Year/Make/Model/Body Style: 2003 Jeep Liberty 4-door
 Vehicle Body Color: Red VIN: 1J4GL48183W539150
 Vehicle NHTSA No.: C30302 Month & Year of Manufacture: 9/2002

Measurements	Description	Left Side	Right Side
M	Seat fore / Aft travel (Front seats)	216	216
T° SEAT FORE/AFT	Horizontal angle {CG-F1 (Left seat) to (Right A-pillar)}	107	-
A1° SEAT FORE/AFT	360° - T°	253	-
W° SEAT FORE/AFT	Horizontal angle {CG-F2 (Left seat) to (Left A-pillar)}	199	-
A2° SEAT FORE/AFT	A2° = W°	199	-
U° SEAT FORE/AFT	Horizontal angle {CG-F2 (Left seat) to (Left B-pillar)}	284	-
B1° SEAT FORE/AFT	B1° = U°	284	-
V° SEAT FORE/AFT	Horizontal angle {CG-FR (Left seat) to (Right B-pillar)}	201	-
B2° SEAT FORE/AFT	B2° = V°	201	-
W° SEAT FORE/AFT	Horizontal angle {CG-F2 (Right seat) to (Right A-pillar)}	-	161
A1° SEAT FORE/AFT	A1° (Right) = W° (Right)	-	161
T° SEAT FORE/AFT	Horizontal angle {CG-F1 (Right seat) to (Left A-pillar)}	-	253
A2° SEAT FORE/AFT	360° - T° (Right)	-	107
V° SEAT FORE/AFT	Horizontal angle {CG-FR (Right seat) to (Right B-pillar)}	-	159
B1° SEAT FORE/AFT	B1° (Right) = V° (Right)	-	159
U° SEAT FORE/AFT	Horizontal angle {CG-F2 (Right seat) to (Right B-pillar)}	-	76
B2° SEAT FORE/AFT	B2° (Right) = U° (Right)	-	76
J	A-pillar {(Plane 3) - (Plane 5)}	338	336
J/2	J ÷ 2	169	168
D1	Upper Roof {(Plane A) - (Plane B)}	2238	
D1/2	D1 ÷ 2	1119	
D2	Upper Roof {(Plane C) - (Plane D)}	1216	
D2/2	D2 ÷ 2	608	
.35D1	.35 x D1	783.3	
.35D2	.35 x D2	425.6	
N	B-pillar {(BP3) - (lowest point on the daylight opening forward of B-pillar)}	493	492
N/2	B-pillar {(BP3) - (lowest point on the daylight opening forward of B-pillar)}	246.5	246

Measurement	Description	Left Side	Right Side
N/4	B-pillar {(BP3) - (lowest point on the daylight opening forward of B-pillar)}	123.25	123
Q	Other-pillar {(OPR) - (lowest point on the daylight opening forward of O-pillar)}	248	247
Q/2	Other-pillar {(OP2) - (lowest point on the daylight opening forward of O-pillar)}	124	123.5
D	{(Corner of roof area, point T) - (roof area center, point M)}	916	915
3D/7	$(3 \times D) \div 7$	393	392
MM	Widest door opening of slider door	-	-
M	$MM \div 2$	-	-

DATA SHEET 2-5

APPROACH ANGLE LIMITS

Left Side					Right Side				
Target Code	Horizontal Angles (deg.)		Vertical Angles (deg.)		Target Code	Horizontal Angles (deg.)		Vertical Angles (deg.)	
	Minimum	Maximum	Minimum	Maximum		Minimum	Maximum	Minimum	Maximum
AP1	199	252	-5	35	AP1	107	161	5	39
AP2	199	252	-5	15	AP2	107	161	-5	14
AP3	199	252	-5	37	AP3	107	161	-5	37
BP1	201	284	-10	27	BP1	76	159	-10	28
BP2	ANY		0	2	BP2	ANY		0	2
BP3	201	284	-10	-9	BP3	76	159	10	-8
BP4	201	284	-10	-10	BP4	76	159	10	-9
OP1	ANY		0	0	OP1	ANY		0	0
OP2	270		-10	0	OP2	90		-10	0
RP1	270	345	-10	-	RP1	15	90	-10	
RP2	270	345	-10	-	RP2	15	90	-10	-
FH1	180		0	50	FH1	180		0	50
FH2	180		0	50	FH2	180		0	50
RH	360		0	-	RH	0		0	
SR1	270		0	44	SR1	90		0	43
SR2A	270		0	37	SR2A	90		0	35
SR2B	270		0	37	SR2B	90		0	35
SR3	270		0	50	SR3	90		0	50
SD	270		0	-	SD	90		0	-
URRP	ANY		0	45	URRP	ANY		0	25

Note: BP2 and OP1 target location - Seat Belt anchorage

DATA SHEET 2-6

POST-TEST VISUAL INSPECTION

Year/Make/Model/Body Style: 2003 Jeep Liberty 4-door
Vehicle Body Color: Red VIN: 1J4GL48183W539150
Vehicle NHTSA No.: C30302 Month & Year of Manufacture: 9/2002

REMARKS:

1. A-pillar grab handle deformed after impact.

DATA SHEET 2-7

TARGET IMPACT LOCATION ON FMDI SUMMARY

Year/Make/Model/Body Style: 2003 Jeep Liberty 4-door
 Vehicle Body Color: Red VIN 1J4G148183W539150
 Vehicle NHTSA No.: C30302 Month & Year of Manufacture: 9/2002



← RIGHT SIDE OF FACE

TARGET	Distance Above Pt. O (mm)	Distance Over From Pt. O (mm)
AP3	16	3 to the left
BP4	13	12 to the right
BP3	21	8 to the right
AP1	30	37 to the left
SR2A	12	7 to the right
URRP	15	24 to the left
OP1	16	8 to the right
SR3B	22	19 to the right
BP3	10	25 to the left
URBP	53	7 to the right

SECTION 3
SUMMARY OF TEST RESULTS AND DATA PLOTS

TEST SUMMARY SHEET FOR FMVSS 201C TESTING

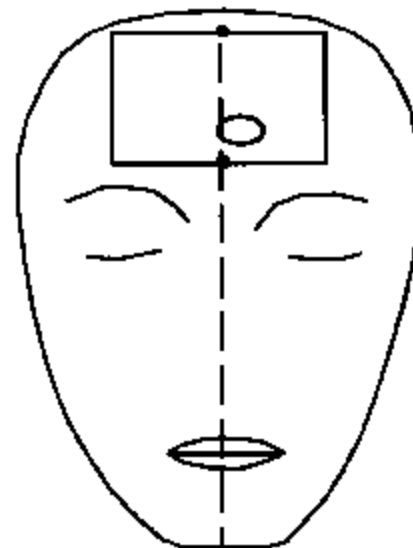
Year/Make/Model/Body Style: 2003 Jeep Liberty 4-door
 Vehicle Body Color: Red VIN: 1J4GL48183W539150
 Vehicle NHTSA No.: C30302 Month & Year of Manufacture: 9/2002

Test Number: 1 Test Date: 1/28/03
 Target Location: A-PILLAR Target Code: AP3
 Horizontal Impact Angle: 137° Vertical Impact Angle: 37°
 Ambient Temperature: 21 °C Time of Impact: 10:30
 Headform Number: 0355

Impact Point:

Description:

Description:	From lower midpoint				
On centerline	16	mm up			
On centerline	3	-	mm right	x	mm left



Free Motion HIC: 260.1 HIC(d) 362.6
 Impact Velocity (kph): 23.49 HIC(T1) 1.8 msec HIC(T2) 17.3 msec

Post Test Comments:

FMVSS 201U IMPACT TEST - 2003 JEEP LIBERTY C30302 - AP3

FMII Headform 0355

Location: AP3

Test Date: January 28, 2003

Work File: AP3

-----TEST RESULTS-----

Lab Temperature: 21 C

HICd: 362.6

Lab Humidity: 13 %

HIC (36ms): 260.1

Velocity at Impact: 23.49 KPH

t1: 1.8 msec

t2: 17.3 msec

Free Flight Distance: 220.14 mm

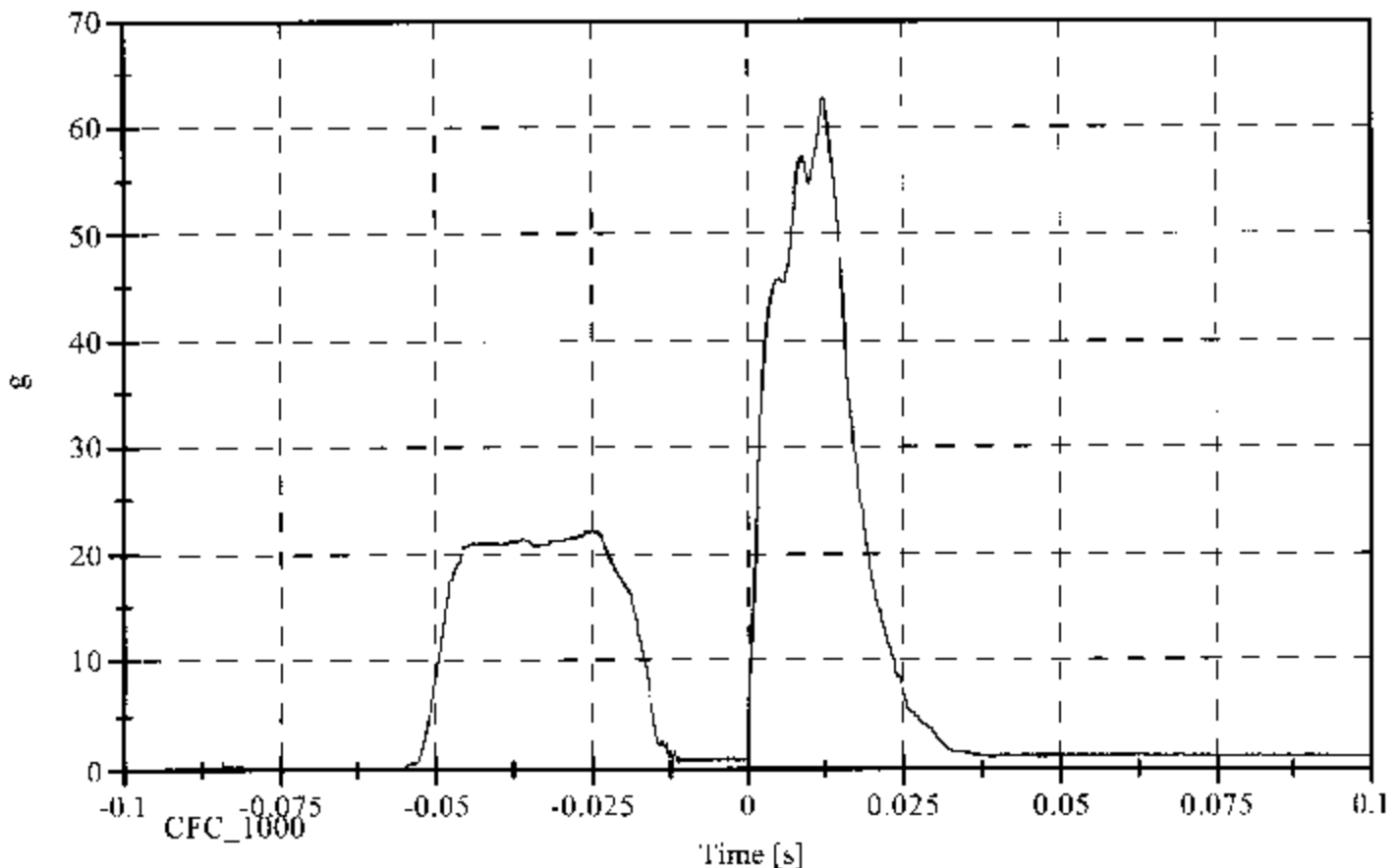
Duration: 15.5 msec

Average Acceleration: 8.7 g

FMVSS 201U IMPACT TEST - 2003 JEEP LIBERTY
Headform Resultant

Max: 62.7 [g] at 0.012 [s]

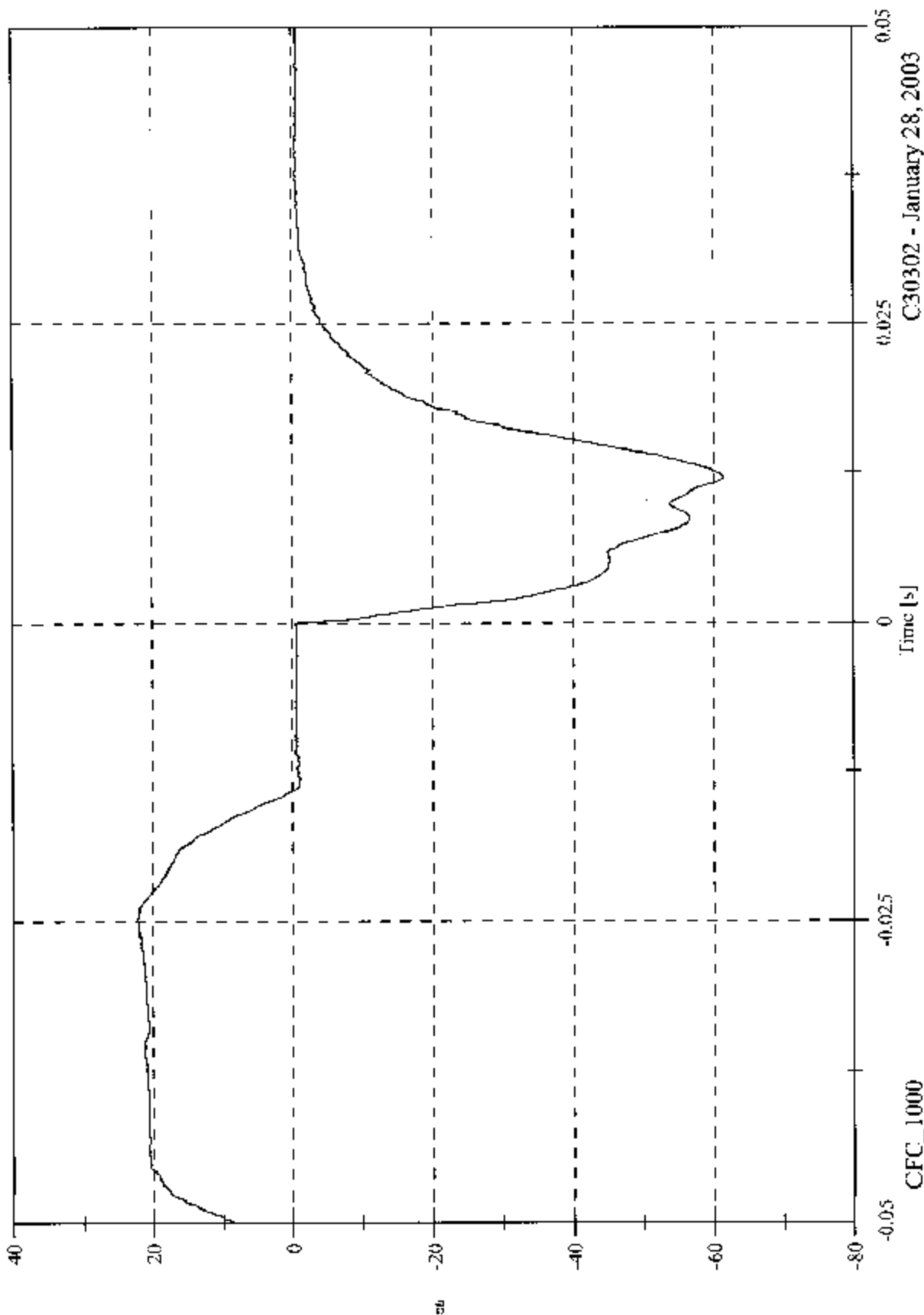
Min: 0.0 [g] at -0.096 [s]



FMVSS 201U IMPACT TEST - 2003 JEEP LIBERTY

Headform X Acceleration

Max: 22.2 [g] at -0.025 [s]
Min: -61.4 [g] at 0.012 [s]



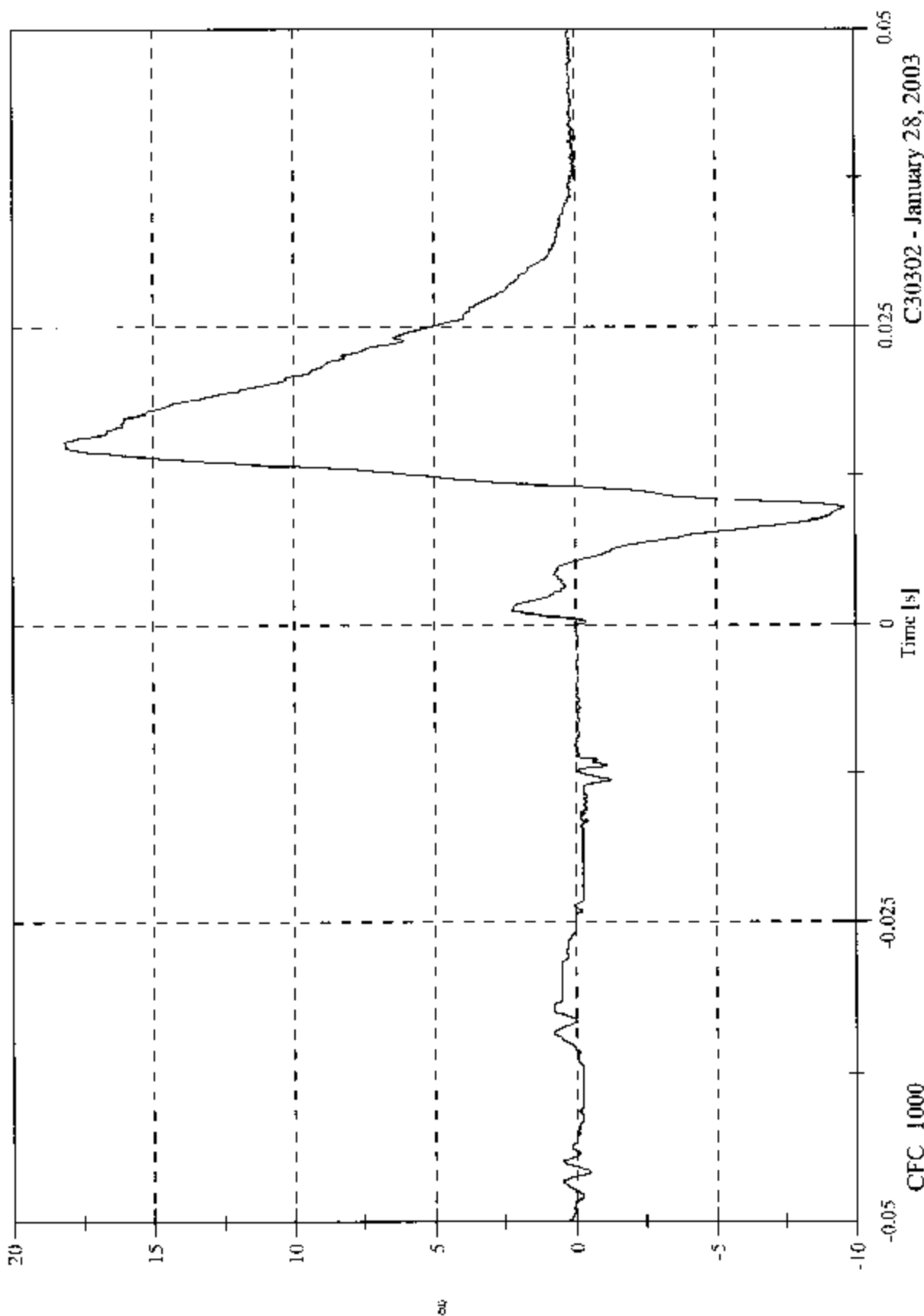
C30302 - January 28, 2003

FMVSS 2010 IMPACT TEST - 2003 JEEP LIBERTY

Headform Y Acceleration

Max: 18.2 [g] at 0.015 [s]

Min: -9.6 [g] at 0.010 [s]



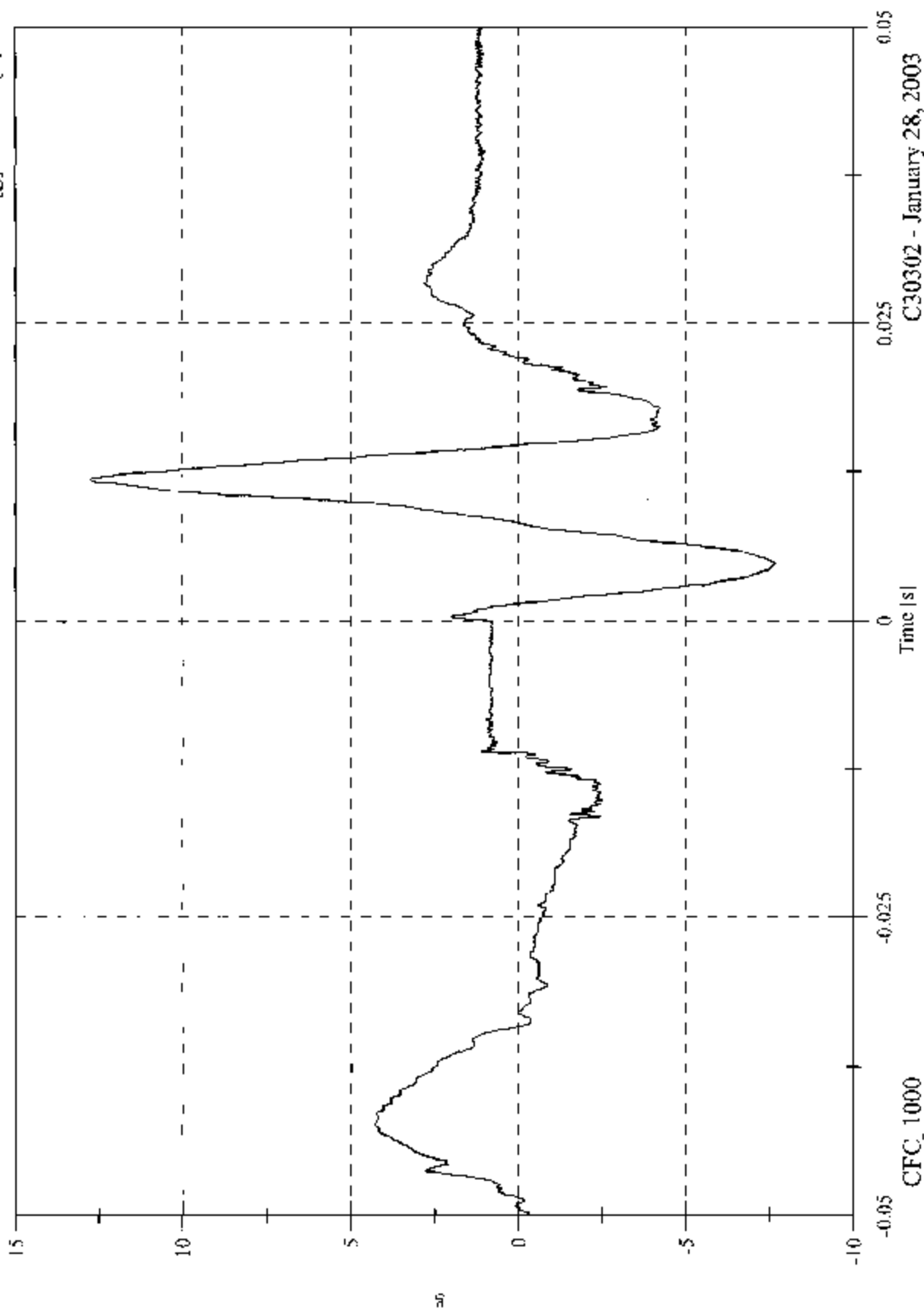
C30302 - January 28, 2003

FMVSS 201U IMPACT TEST - 2003 JEEP LIBERTY

Max: 12.8 [g] at 0.012 [s]

Min: -7.6 [g] at 0.005 [s]

Headform Z Acceleration



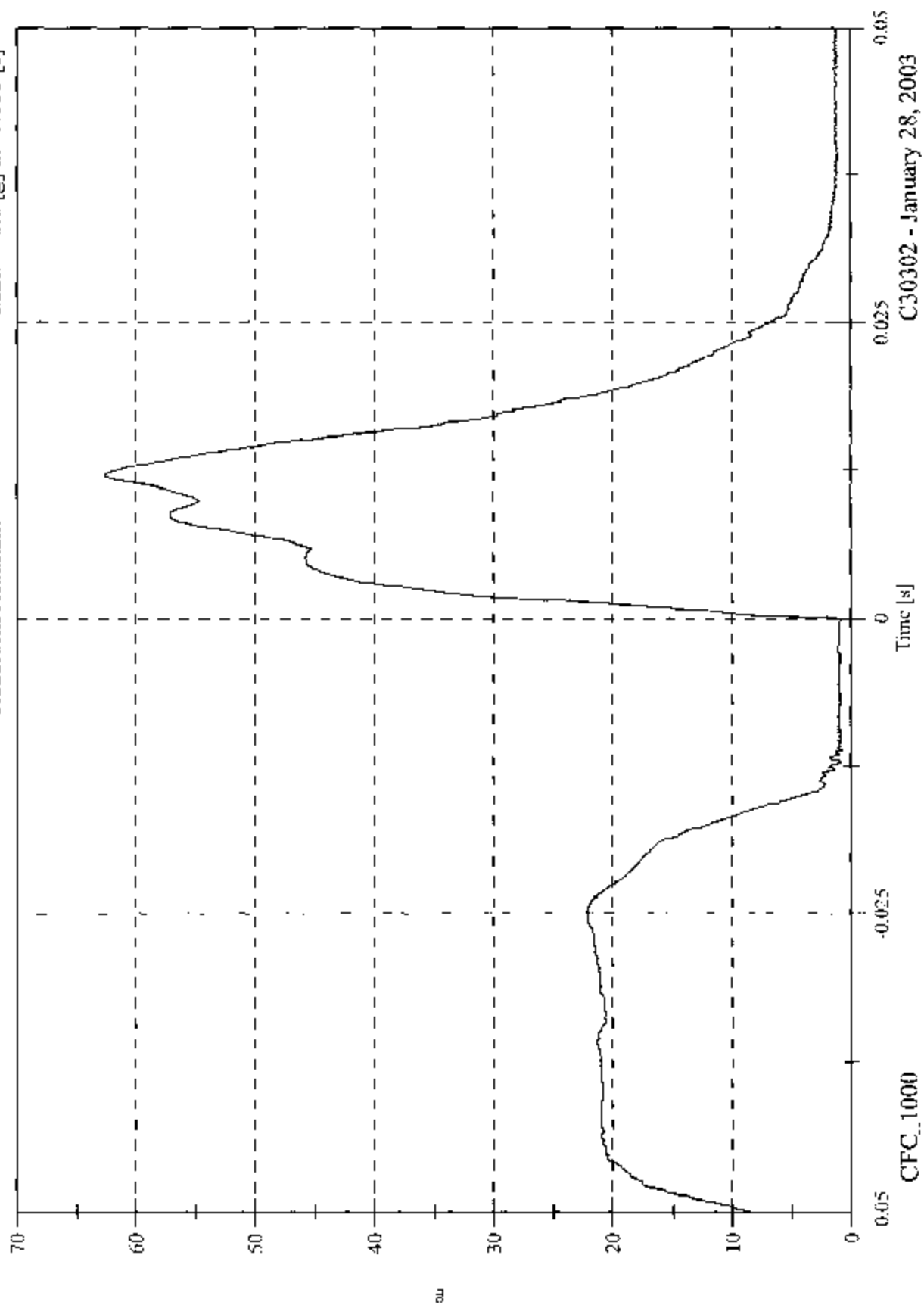
C30302 - January 28, 2003

FMVSS 201U IMPACT TEST - 2003 JEEP LIBERTY

Headform Resultant

Max: 62.7 [g] at 0.012 [s]

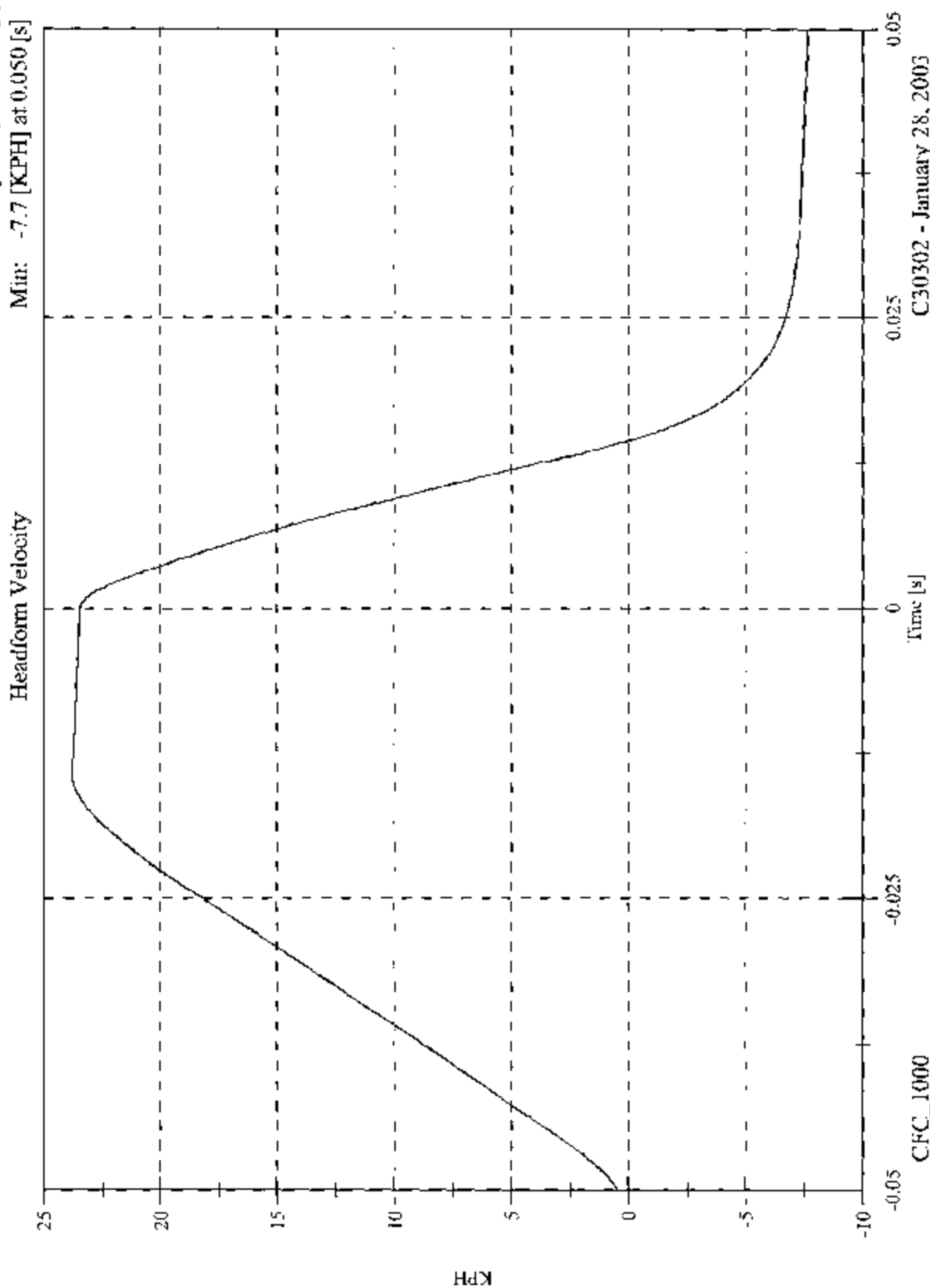
Min: 0.8 [g] at -0.011 [s]



C30302 PASSENGER SIDE AP3 IMPACT PLOT #4

FMVSS 201U IMPACT TEST - 2003 JEEP LIBERTY

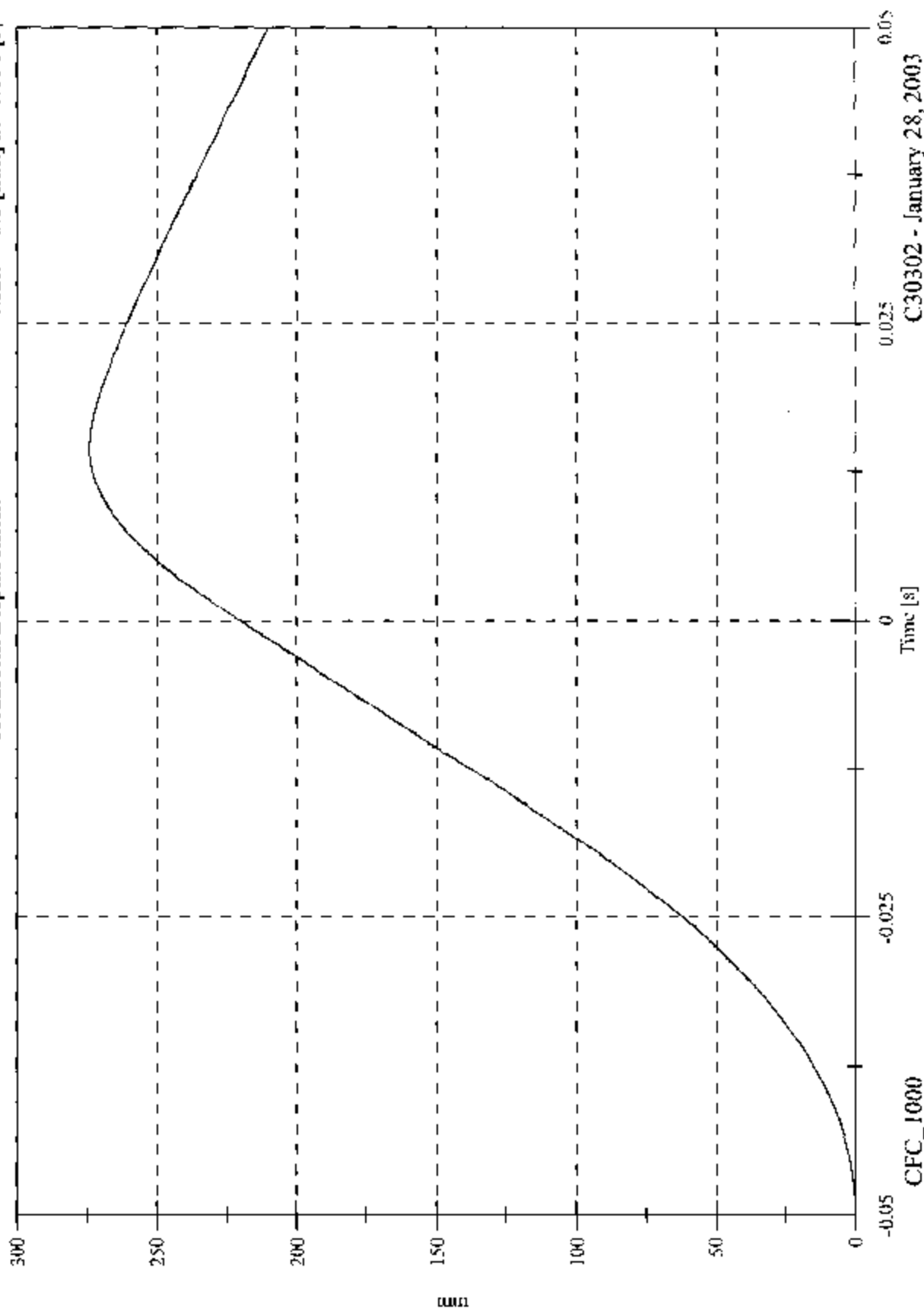
Max: 23.8 [KPH] at -0.014 [s]
Min: -7.7 [KPH] at 0.050 [s]



FMVSS 201U IMPACT TEST - 2003 JEEP LIBERTY

Max: 274.2 [mm] at 0.014 [s]
Min: 0.1 [mm] at -0.050 [s]

Headform Displacement



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Figure PRO-DIST-AP1



Figure : POST-TEST AP3

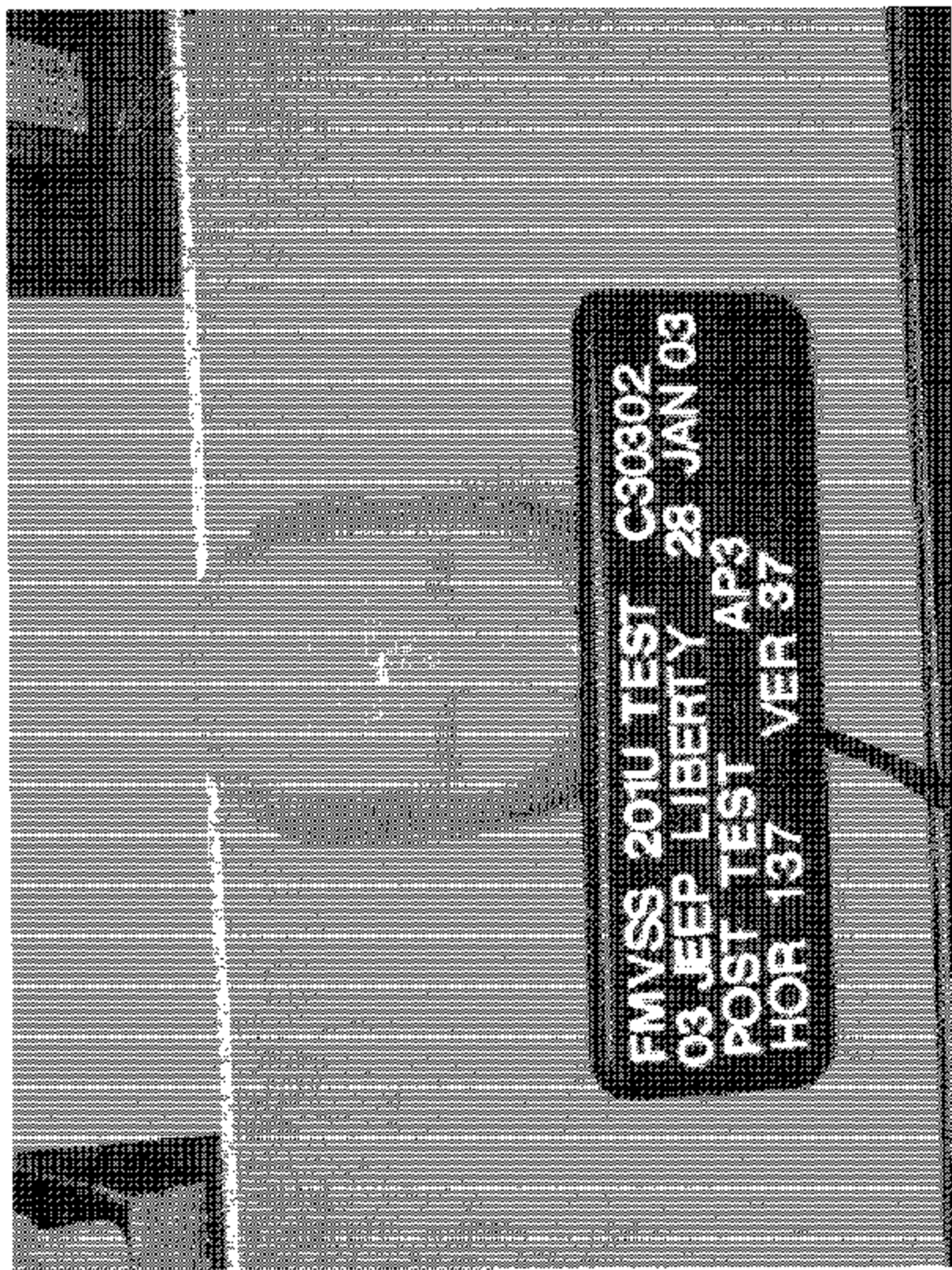


Figure AP3 HEADFORM

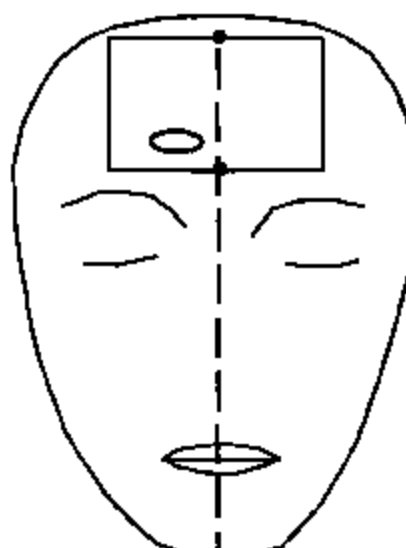
Year/Make/Model/Body Style: 2003 Jeep Liberty 4-door
 Vehicle Body Color: Red VIN: 1J4GL48183W539150
 Vehicle NHTSA No.: C30302 Month & Year of Manufacture: 9/2002

Test Number: 2 Test Date: 1/28/03
 Target Location: B-PILLAR Target Code: BP4
 Horizontal Impact Angle: 136° Vertical Impact Angle: -9°
 Ambient Temperature: 21 °C Time of Impact: 11:30
 Headform Number: 0062

Impact Point:

Description:

Description: <u>From lower midpoint</u>				
On centerline	13	mm up		
On centerline	12	x	mm right	- mm left



Free Motion HIC: 683.6 HIC(d): 682.2
 Impact Velocity (kph): 23.72 THCT1: 2.7 msec THCT2: 9.3 msec

Post-Test Comments:

FMVSS 201U IMPACT TEST - 2003 JEEP LIBERTY C30302 - BP4

FMH Headform 0062

Location: BP4

Test Date: January 28, 2003

Work File: BP4

-----TEST RESULTS-----

Lab Temperature: 21 C

HICd: 682.2

Lab Humidity: 13 %

HIC (36ms): 683.6

Velocity at Impact: 23.72 KPH

t1: 2.7 msec

t2: 9.3 msec

Free Flight Distance: 213.49 mm

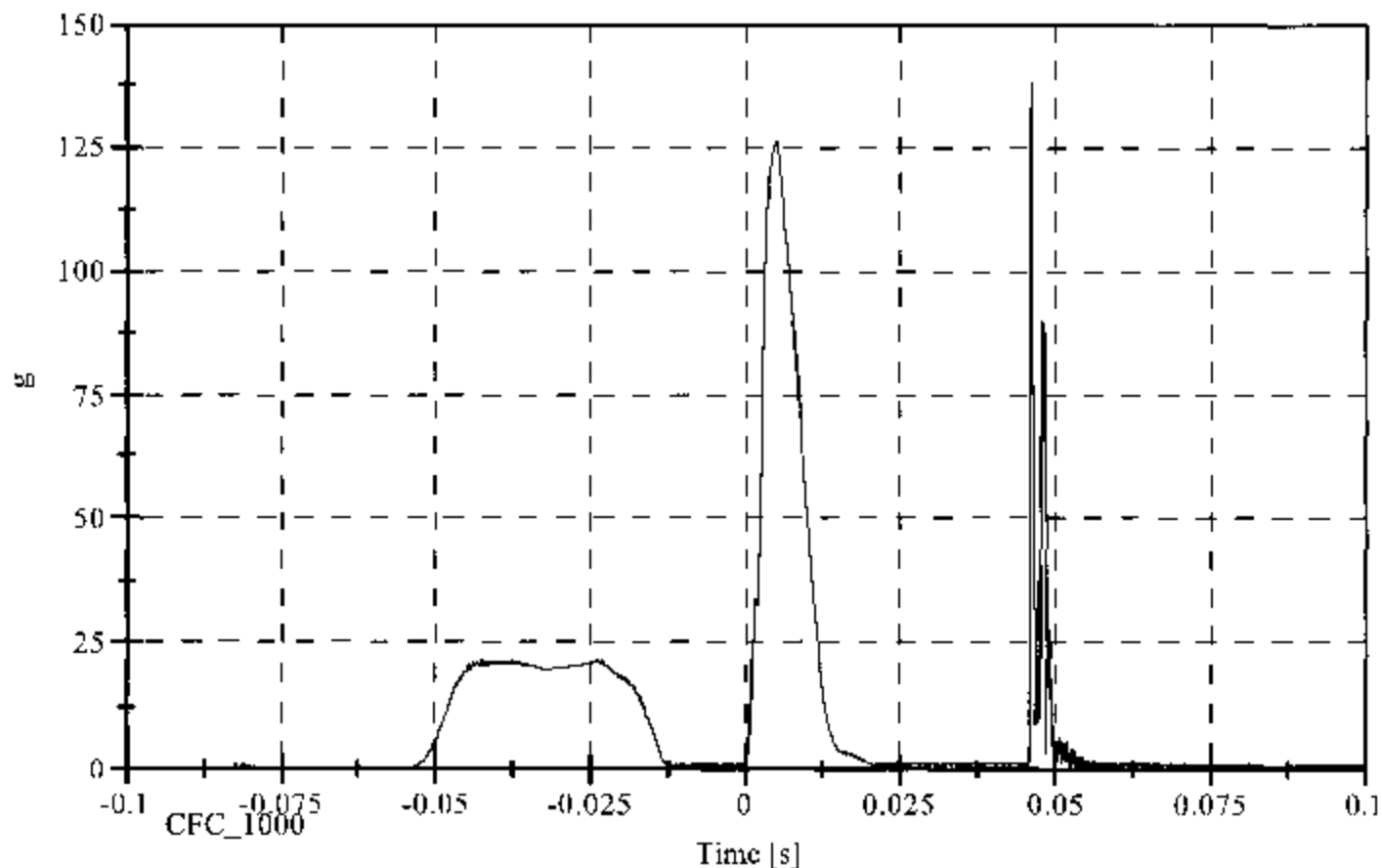
Duration: 6.6 msec

Average Acceleration: 9.2 g

FMVSS 201U IMPACT TEST - 2003 JEEP LIBERTY
Headform Resultant

Max: 137.9 [g] at 0.046 [s]

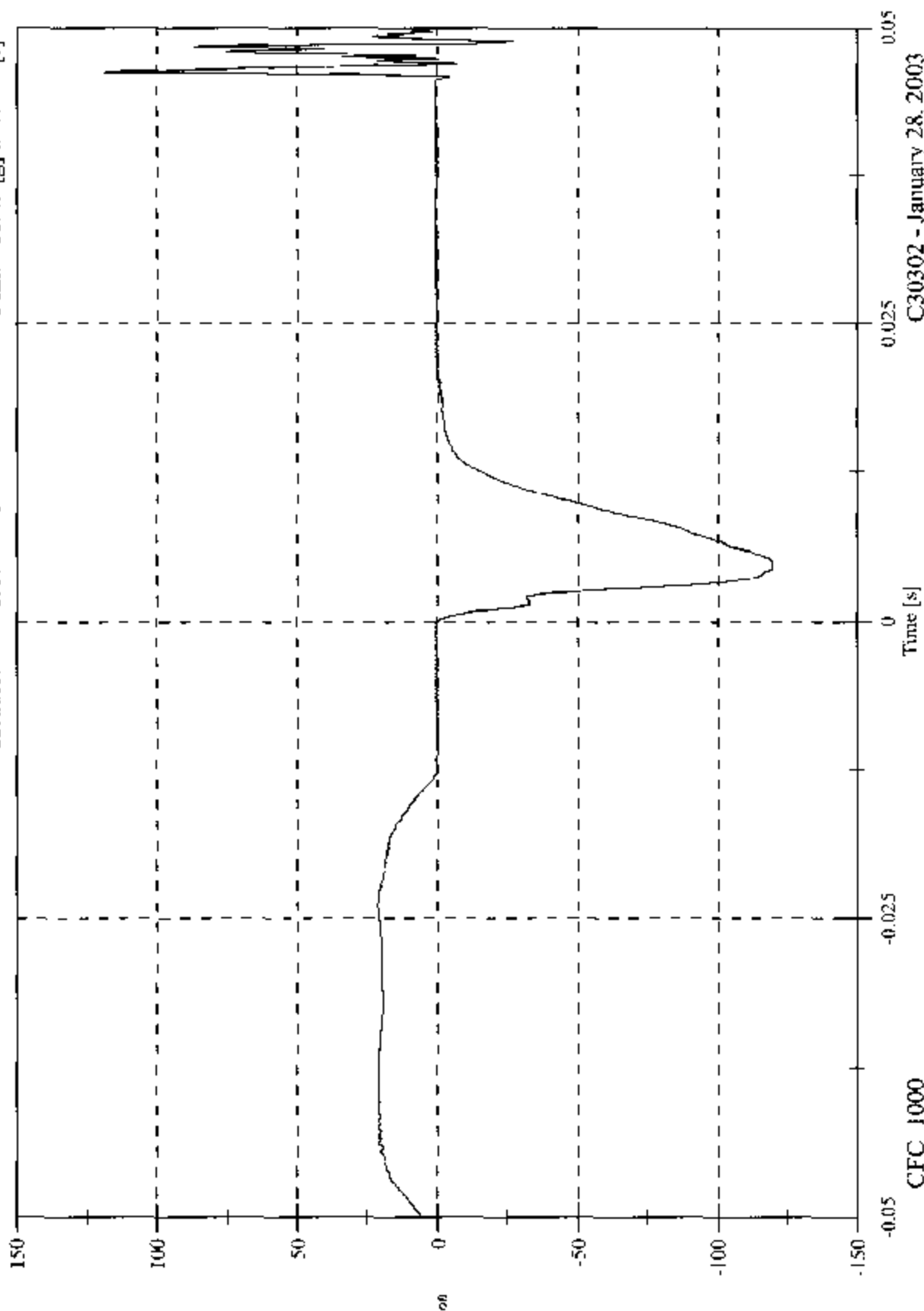
Min: 0.0 [g] at -0.064 [s]



FMVSS 201U IMPACT TEST - 2003 JEEP LIBERTY

Headform X Acceleration

Max: 119.4 [g] at 0.046 [s]
Min: -119.5 [g] at 0.005 [s]

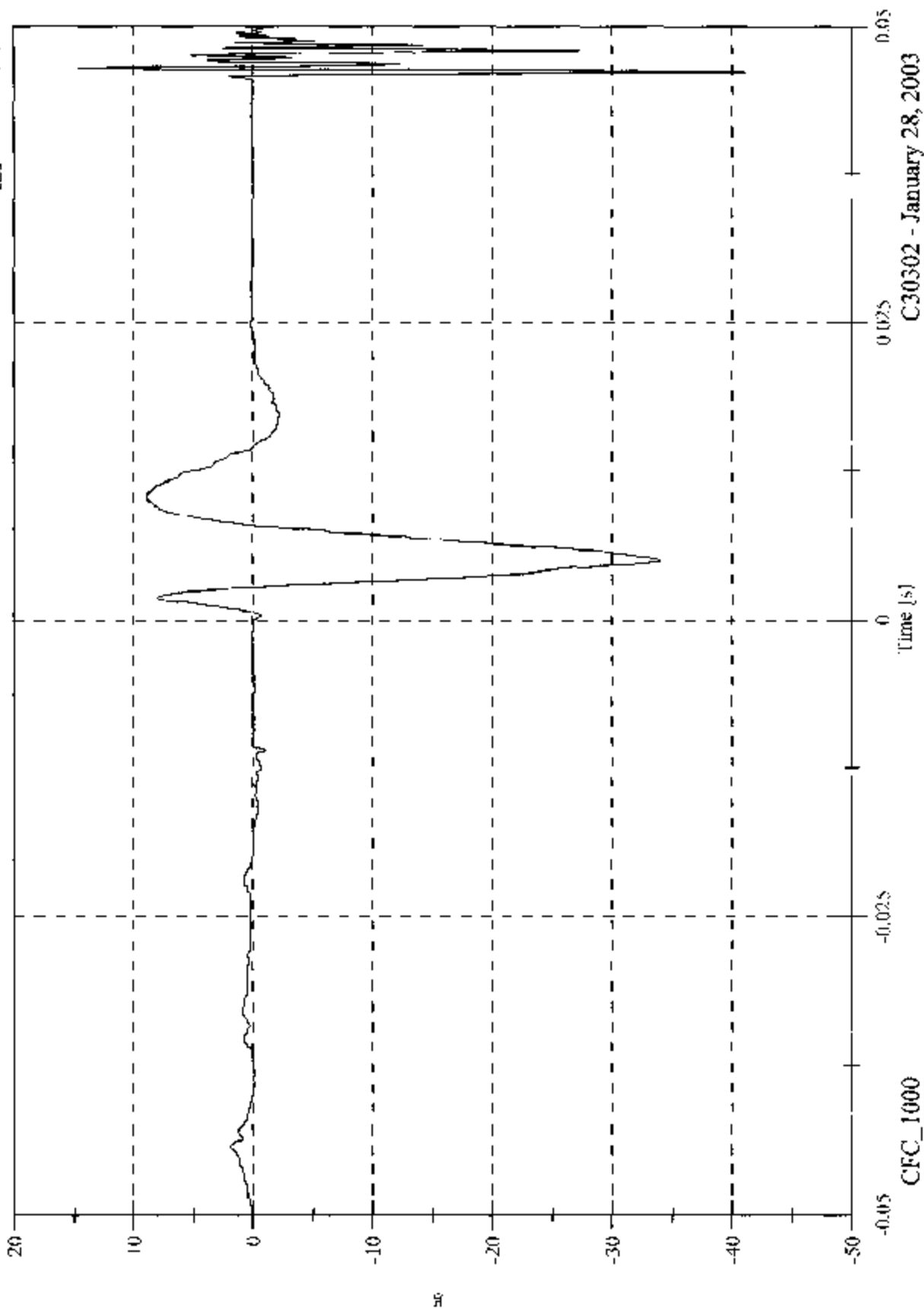


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FMVSS 201U IMPACT TEST - 2003 JEEP LIBERTY

Headform Y Acceleration

Max: 14.7 [g] at 0.046 [s]
Min: -41.1 [g] at 0.046 [s]



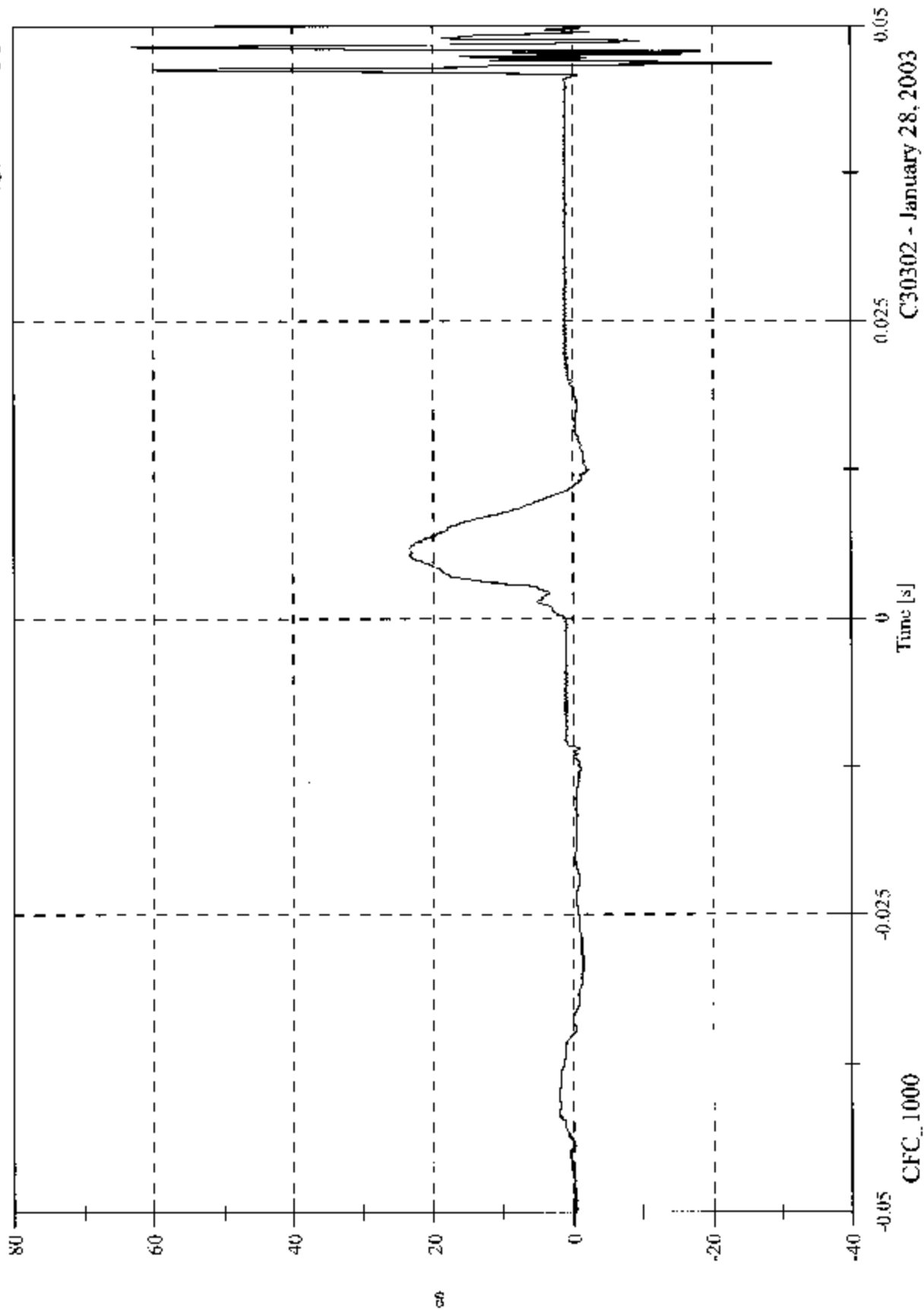
C30302 - January 28, 2003

FMVSS 201U IMPACT TEST - 2003 JEEP LIBERTY

Headform Z Acceleration

Max: 63.2 [g] at 0.048 [s]

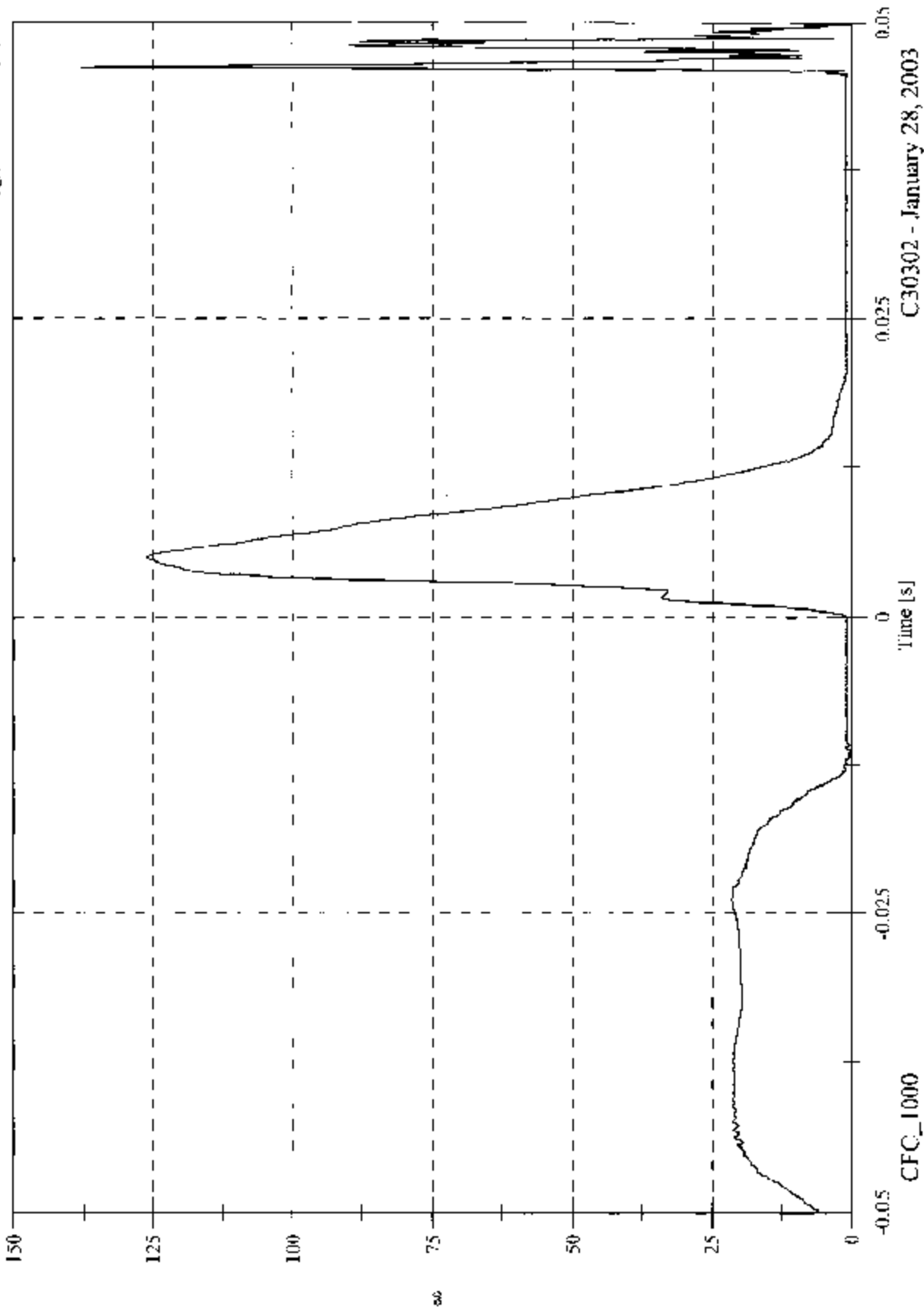
Min: -28.8 [g] at 0.047 [s]



FMVSS 201U IMPACT TEST - 2003 JEEP LIBERTY

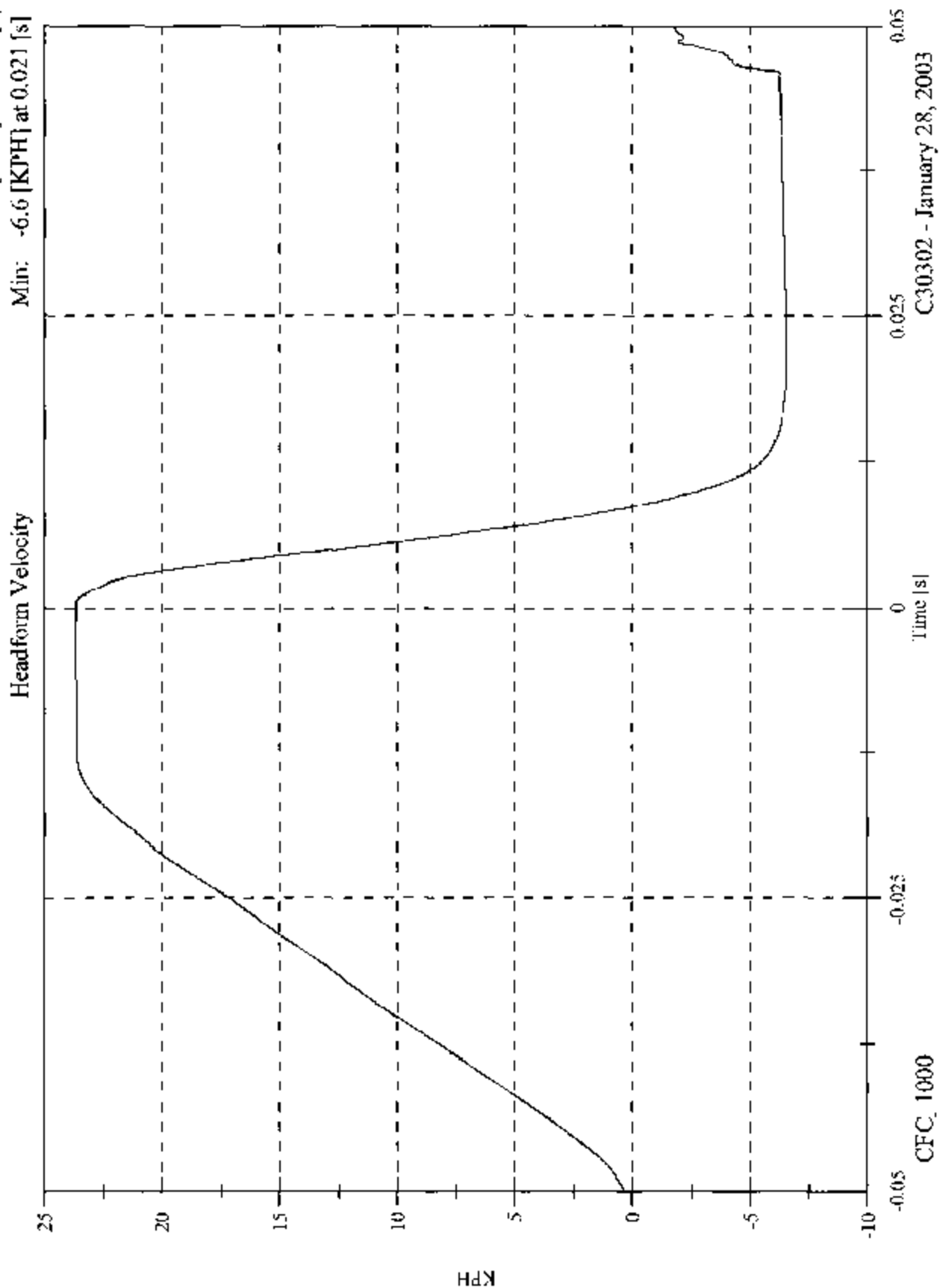
Headform Resultant

Max: 137.9 [g] at 0.046 [s]
Min: 0.3 [g] at -0.011 [s]



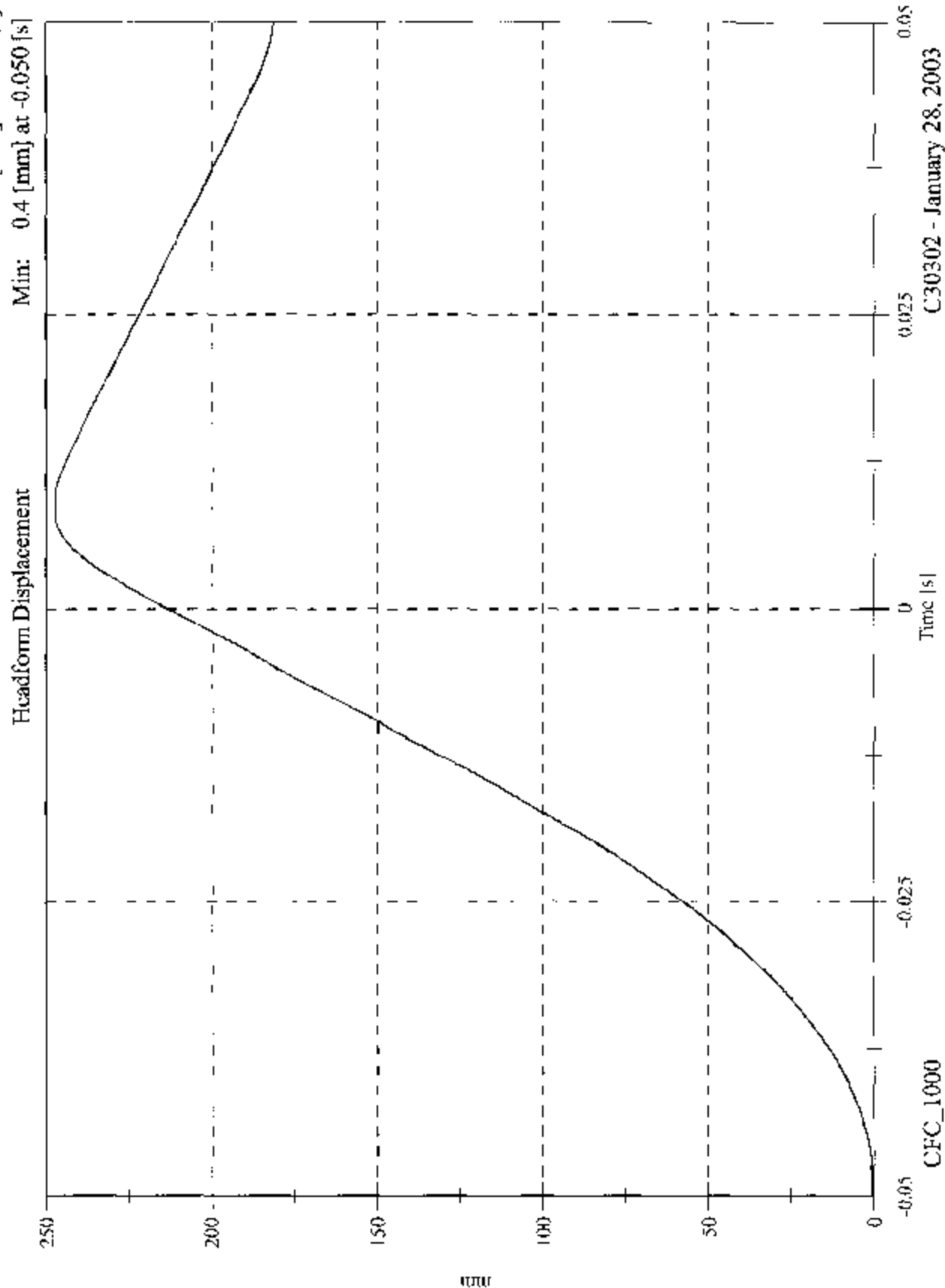
FMVSS 201U IMPACT TEST - 2003 JEEP LIBERTY

Max: 23.7 [KPH] at 0.000 [s]
 Min: -6.6 [KPH] at 0.021 [s]



C30302 PASSENGER SIDE BP4 IMPACT PLOT #5

FMVSS 201U IMPACT TEST - 2003 JEEP LIBERTY



C30302 - January 28, 2003

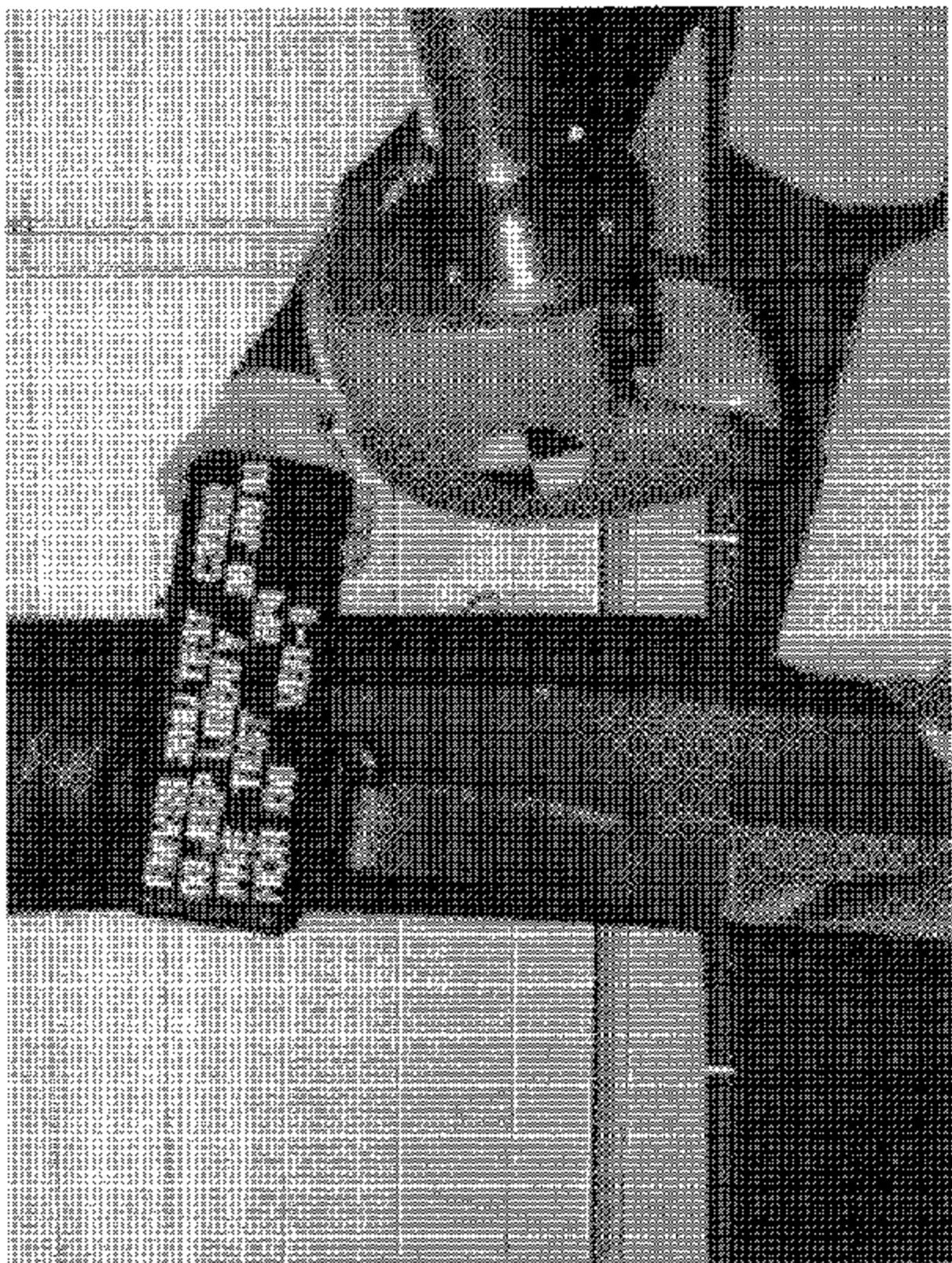


Figure : PRU-TEST BM



Figure POST-TEST BP4

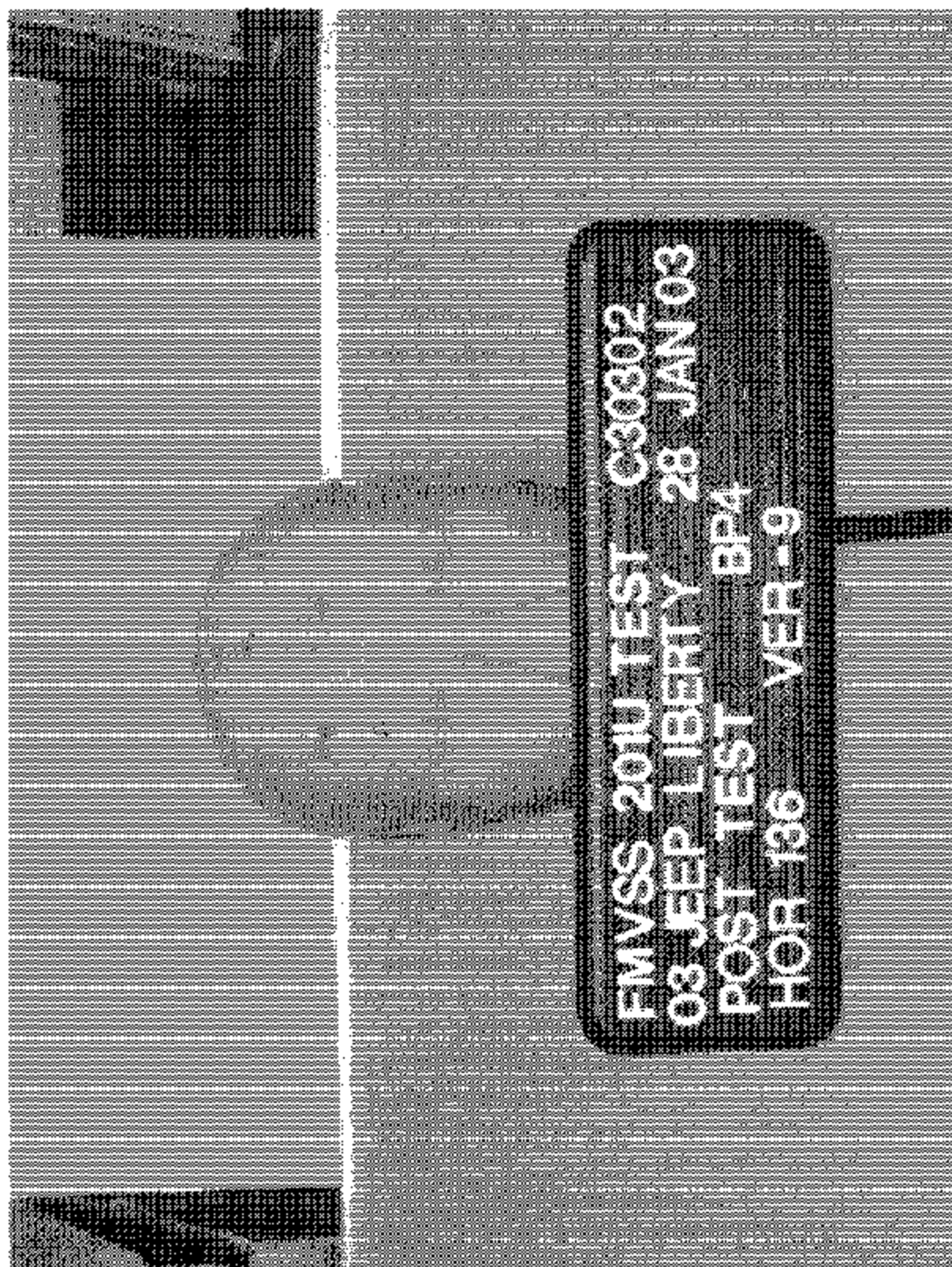


Figure : BP4 HEADFORM

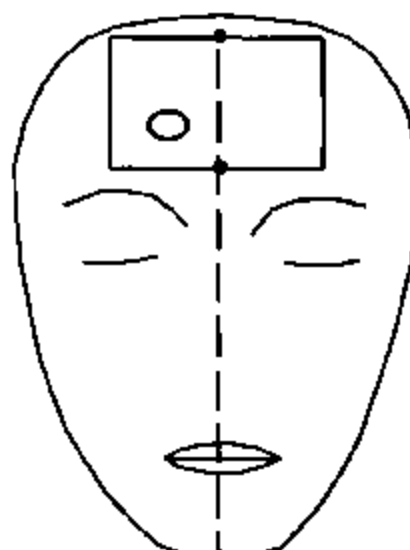
Year/Make/Model/Body Style: 2003 Jeep Liberty 4-door
 Vehicle Body Color: Red VIN: 1J4GL48183W539150
 Vehicle NHTSA No.: C30302 Month & Year of Manufacture: 9/2002

Test Number: 3 Test Date: 1/28/03
 Target Location: B-PILLAR Target Code: BP1
 Horizontal Impact Angle: 90 ° Vertical Impact Angle: 28 °
 Ambient Temperature: 21 °C Time of Impact: 12:10
 Headform Number: 0642

Impact Point:

Description:

Description:	From lower midpoint				
On centerline	21	mm up			
On centerline	8	x	mm right	-	mm left



Free Motion HIC: 655.5 HIC(d): 660.9
 Impact Velocity (kph): 23.56 HIC11: 3.3 msec HIC12: 10.8 msec

Post-Test Comments:

FMVSS 201U IMPACT TEST - 2003 JEEP LIBERTY C30302 - BP1

FMII Headform 0642

Location: BP1

Test Date: January 28, 2003

Work File: BP1

TEST RESULTS

Lab Temperature: 21 C

HICd: 660.9

Lab Humidity: 13 %

HIC (36ms): 655.5

Velocity at Impact: 23.56 KPH

t1: 3.3 msec

t2: 10.8 msec

Free Flight Distance: 216.76 mm

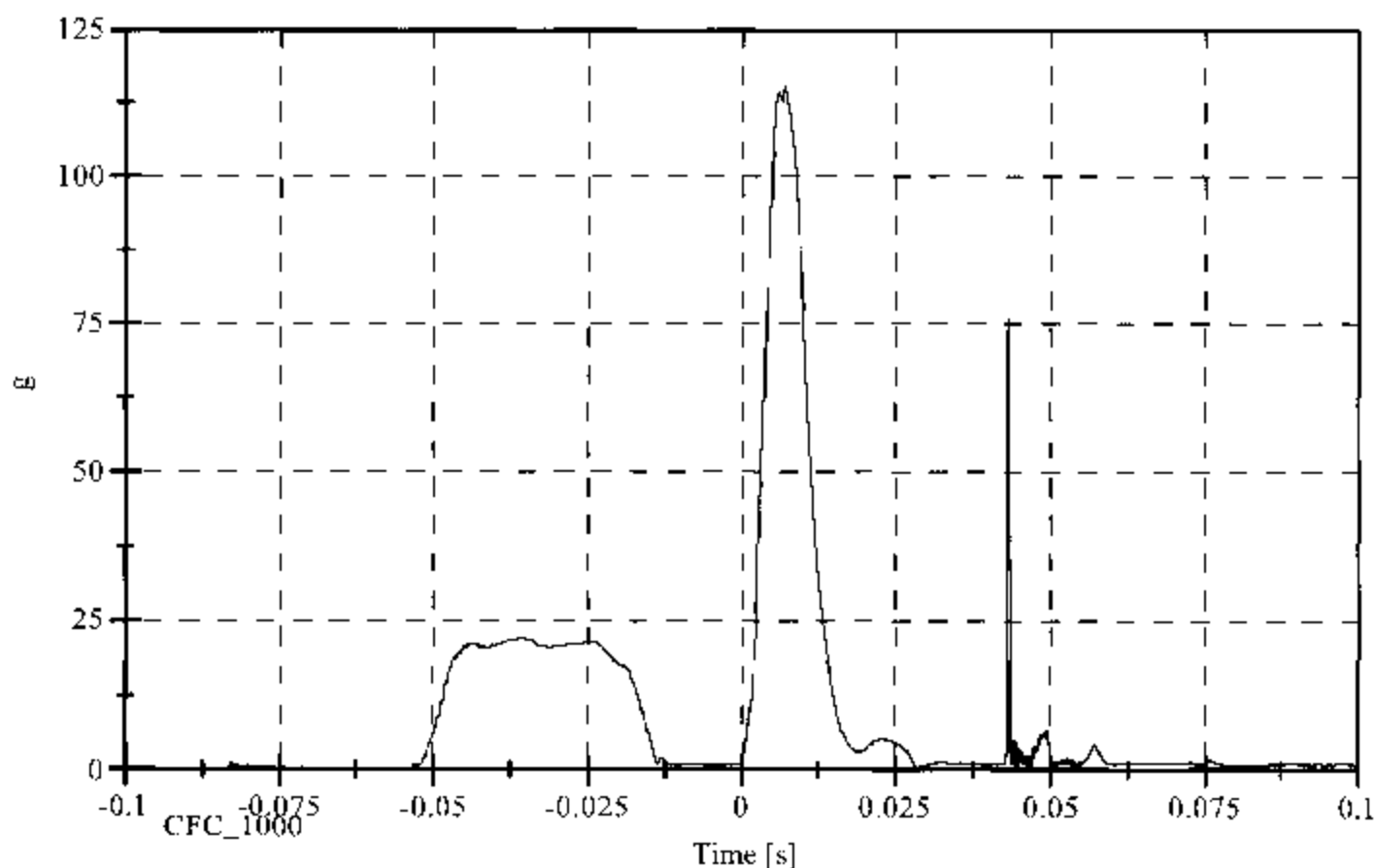
Duration: 7.4 msec

Average Acceleration: 8.9 g

FMVSS 201U IMPACT TEST - 2003 JEEP LIBERTY
Headform Resultant

Max: 115.1 [g] at 0.007 [s]

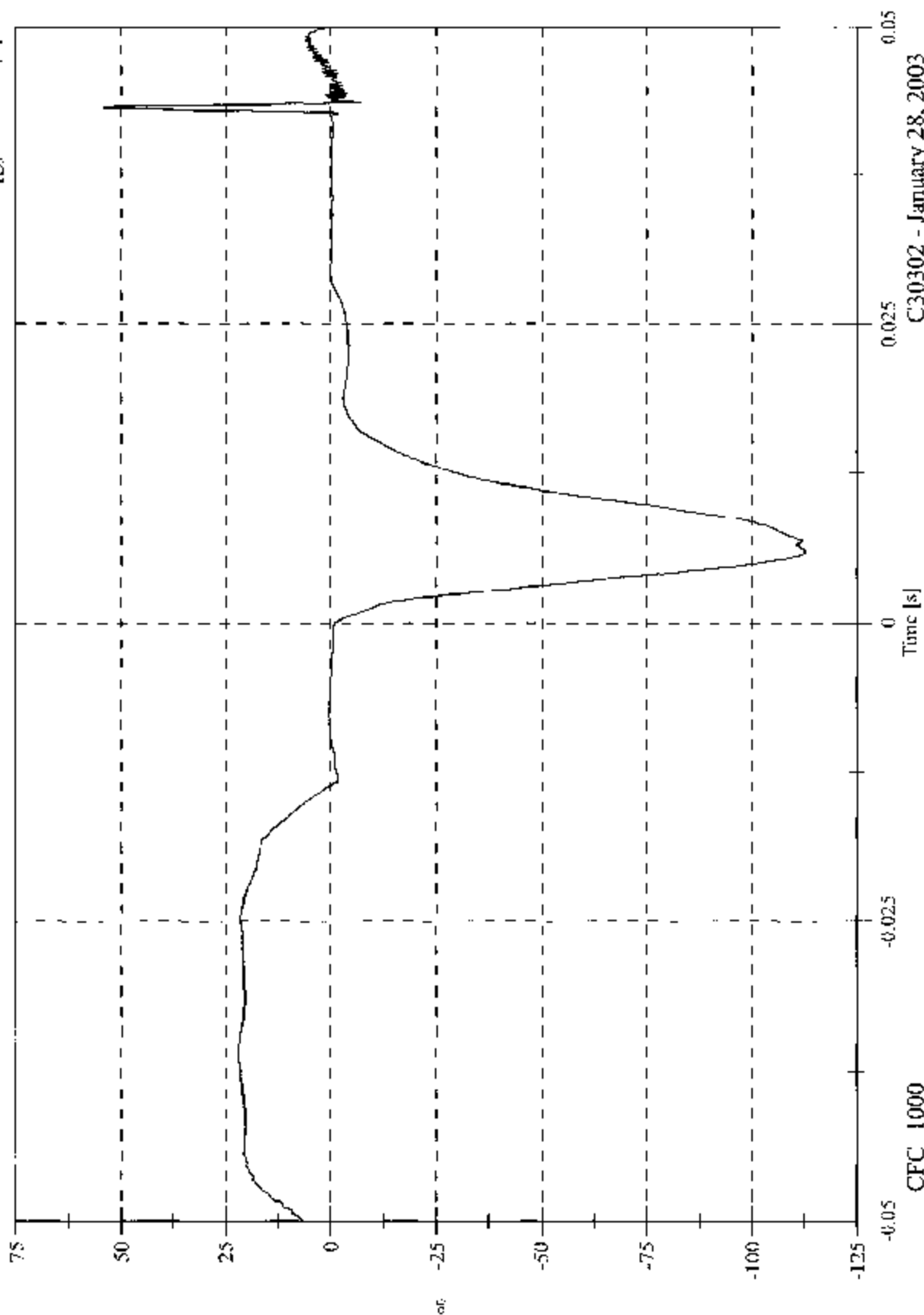
Min: 0.0 [g] at -0.099 [s]



FMVSS 201U IMPACT TEST - 2003 JEEP LIBERTY

Headform X Acceleration

Max: 54.2 [g] at 0.043 [s]
Min: -112.6 [g] at 0.006 [s]

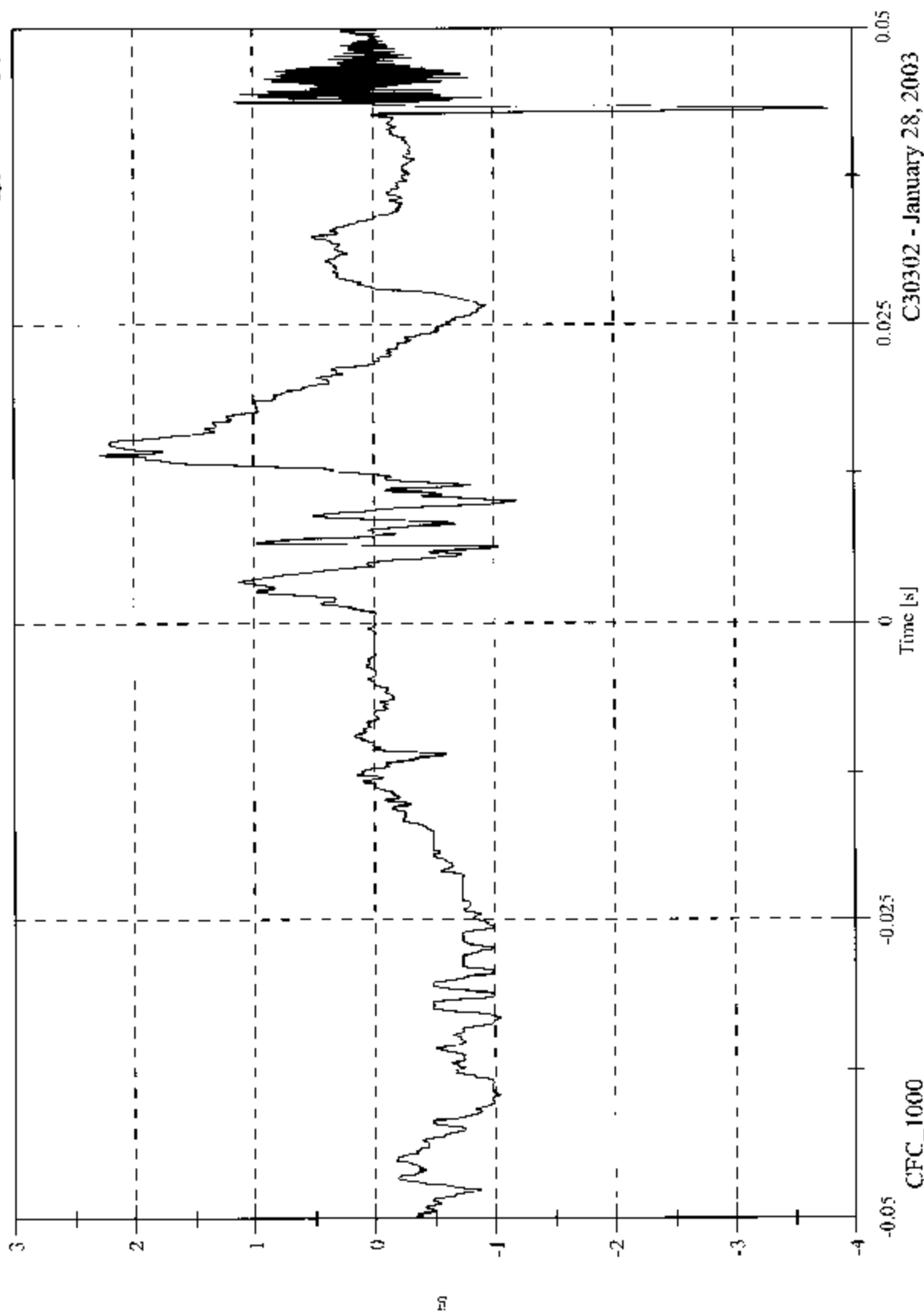


C30302 - January 28, 2003

FMVSS 201U IMPACT TEST - 2003 JEEP LIBERTY

Headform Y Acceleration

Max: 2.3 [g] at 0.014 [s]
Min: -3.8 [g] at 0.043 [s]

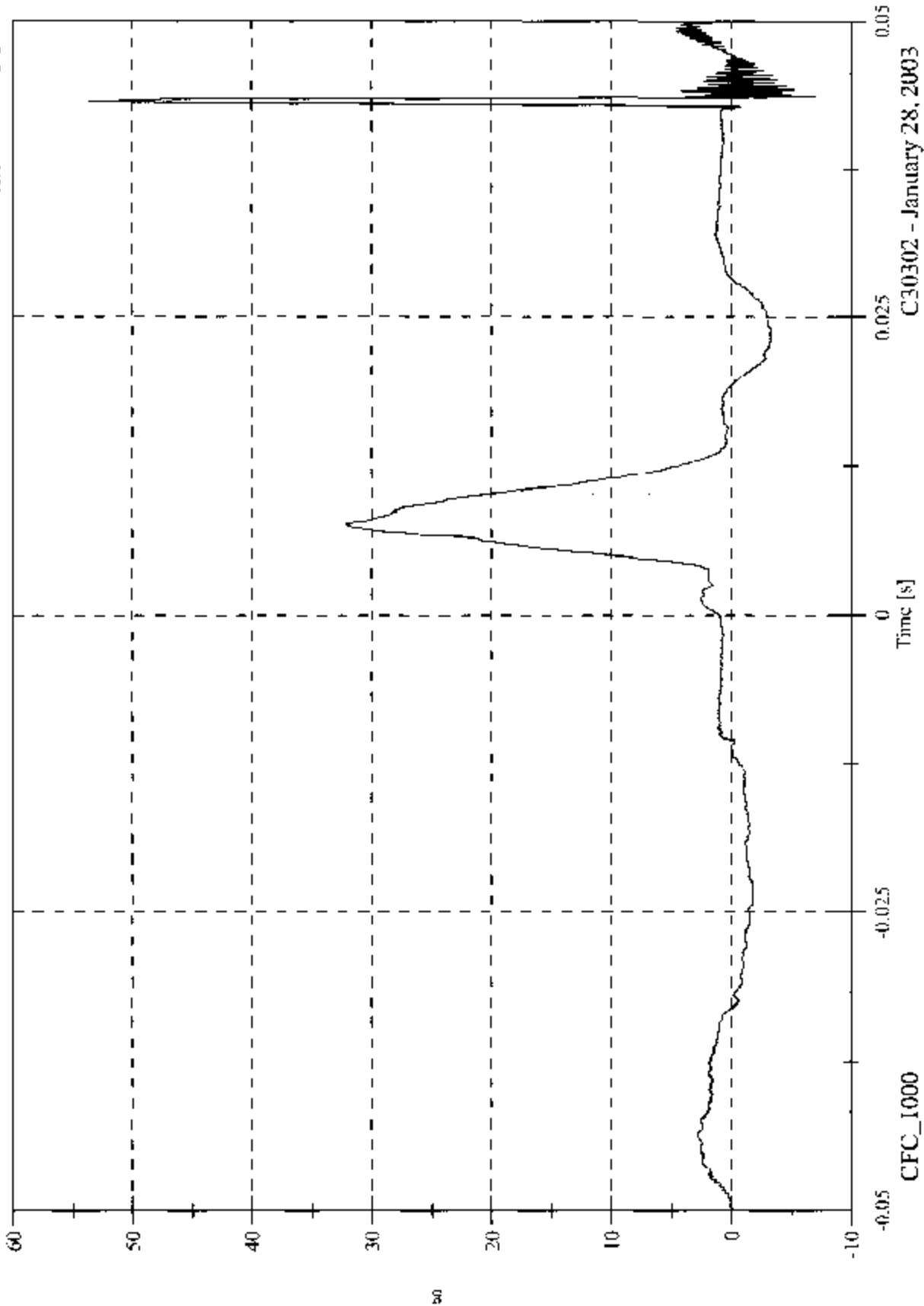


C30302 - January 28, 2003

FMVSS 2010 IMPACT TEST - 2003 JEEP LIBERTY

Headform Z Acceleration

Max: 53.7 [g] at 0.043 [s]
Min: -7.0 [g] at 0.044 [s]

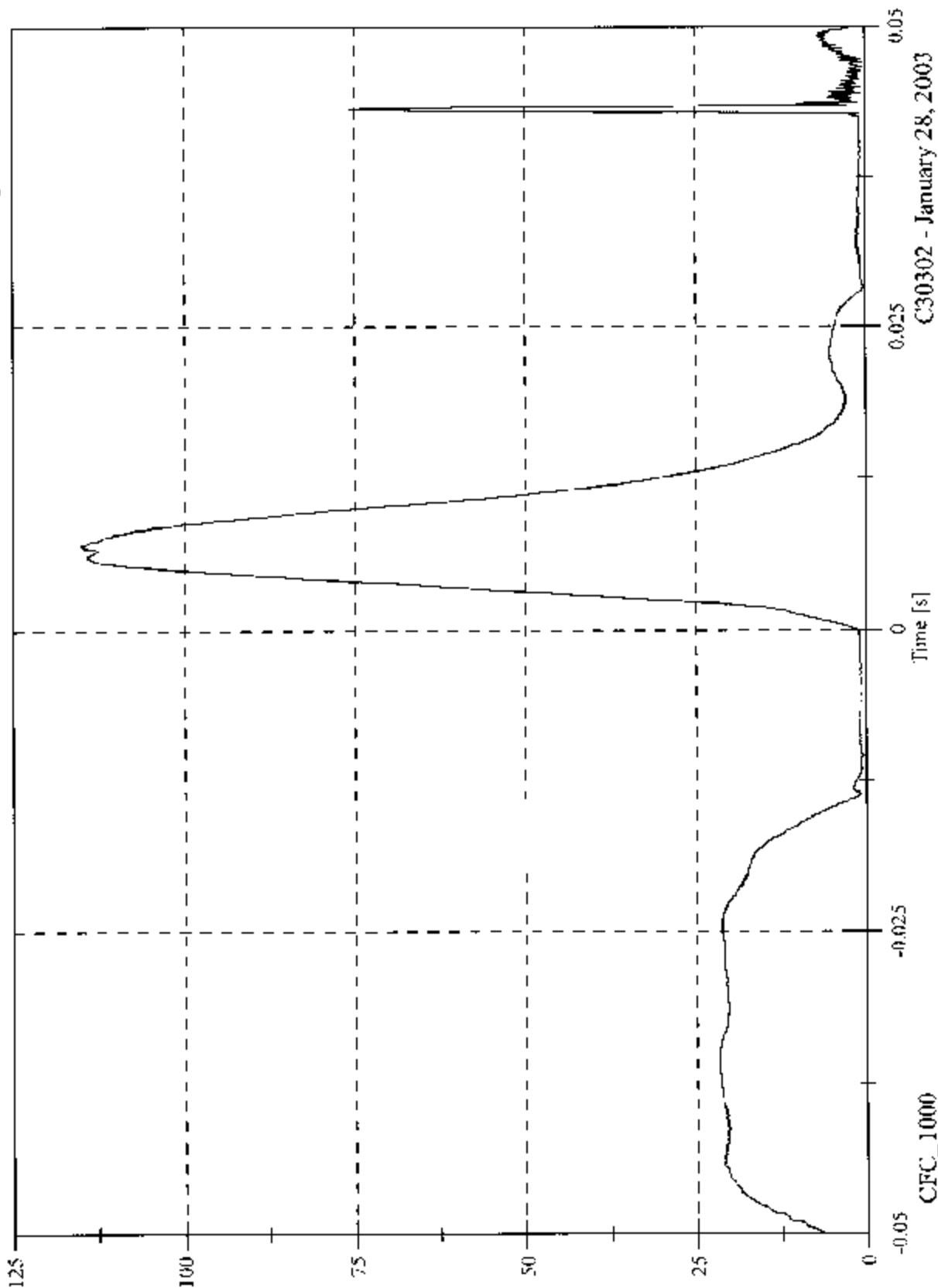


FMVSS 201C IMPACT TEST - 2003 JEEP LIBERTY

Headform Resultant

Max: 115.1 [g] at 0.007 [s]

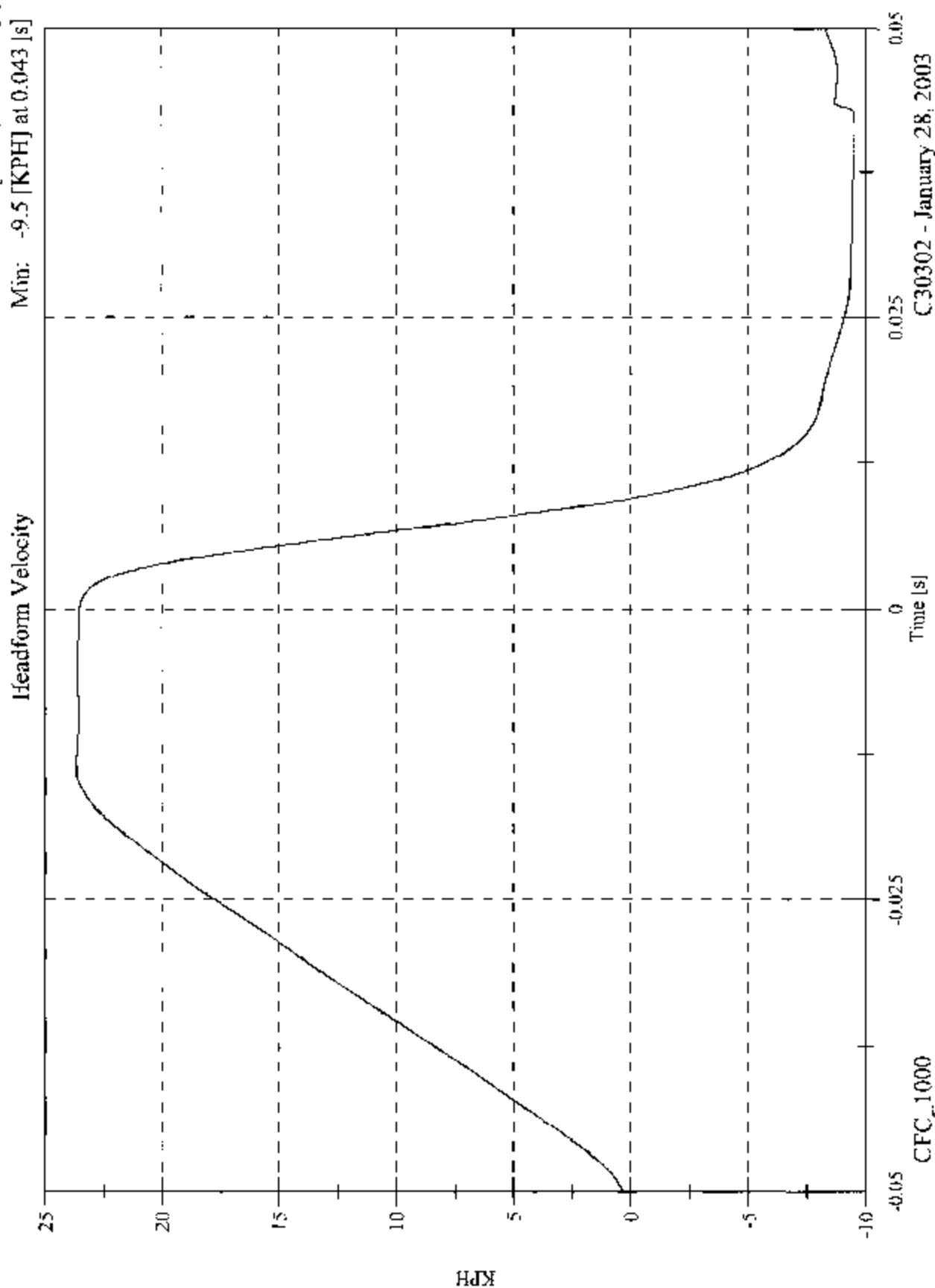
Min: 0.3 [g] at 0.028 [s]



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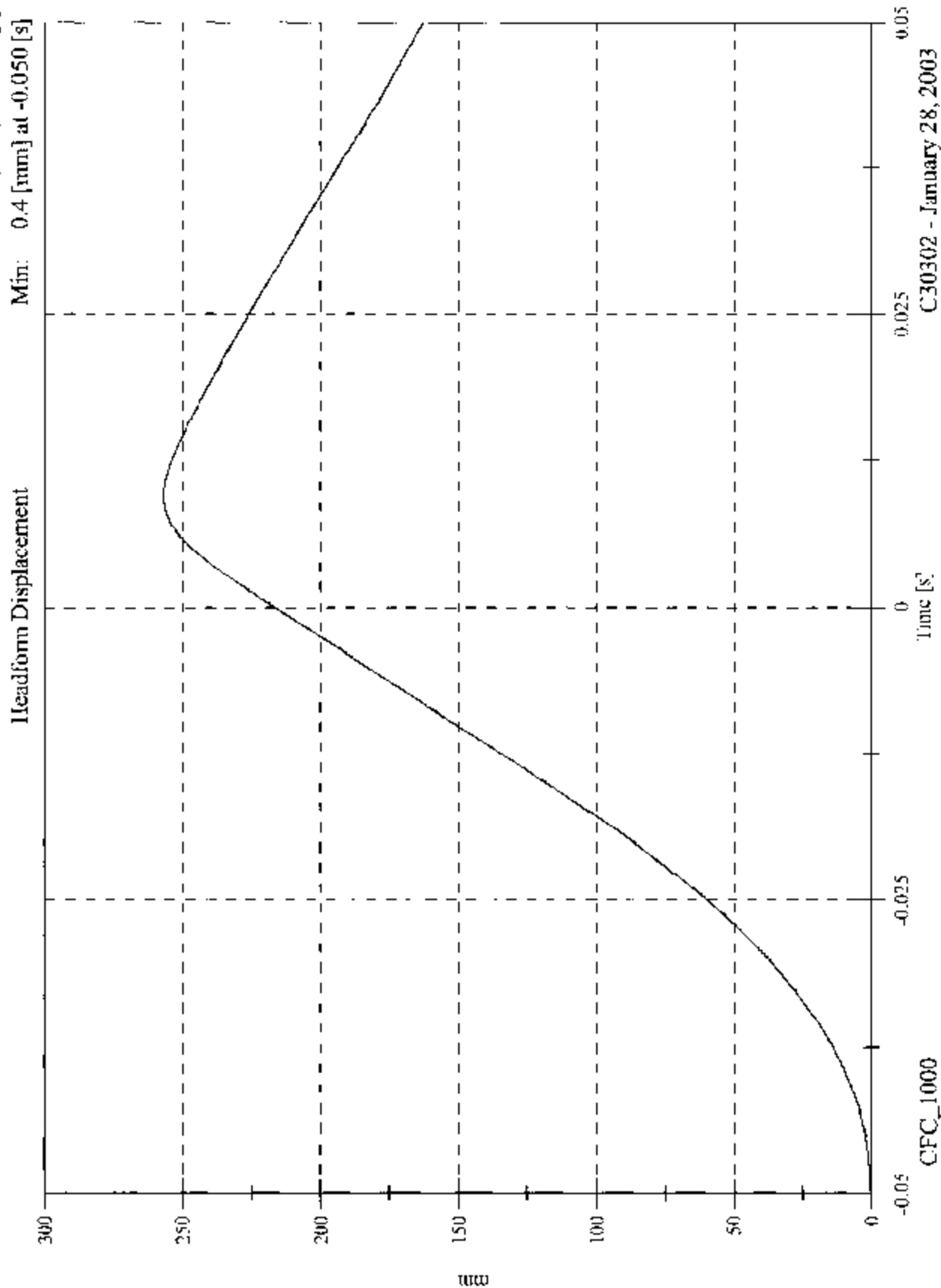
FMVSS 201U IMPACT TEST - 2003 JEEP LIBERTY

Max: 23.7 [KPH] at -0.014 [s]
 Min: -9.5 [KPH] at 0.043 [s]



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FMVSS 201U IMPACT TEST - 2003 JH-P LIBERTY



C30302 - January 28, 2003

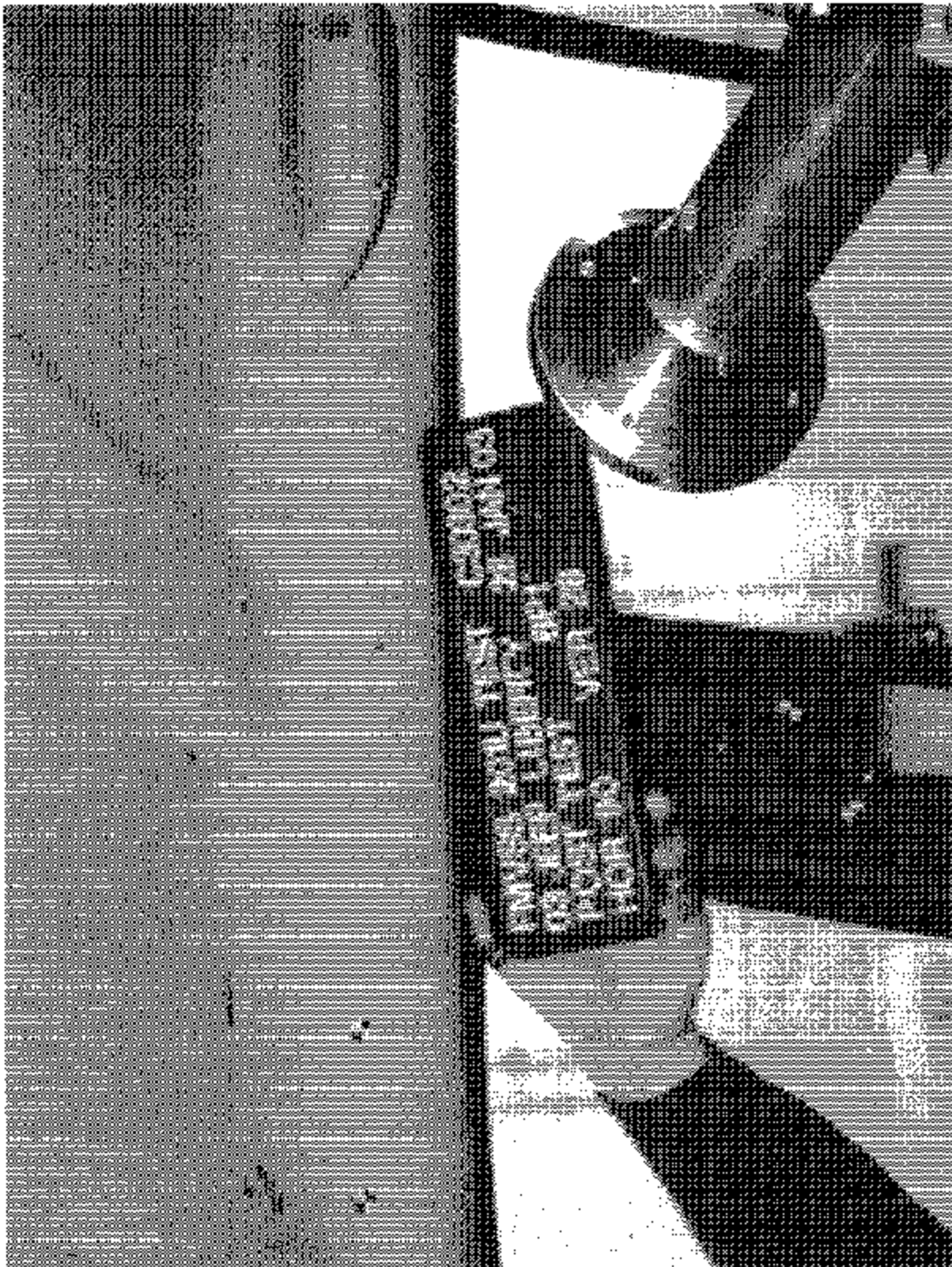


Figure - POST-TEST (R)

FMVSS 2010 TEST C30302
03 JEEP LIBERTY 28 JAN 03
POST TEST BPI
HOR 90 VER 28

Figure : BPI HEADFORM

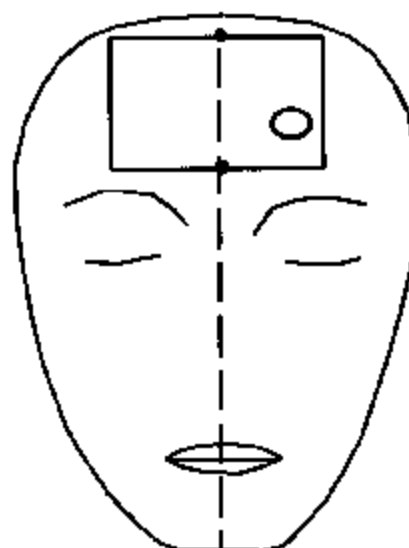
Year/Make/Model/Body Style: 2003 Jeep Liberty 4-door
 Vehicle Body Color: Red VIN: 1J4GL48183W539150
 Vehicle NHTSA No.: C30302 Month & Year of Manufacture: 9/2002

Test Number: 4 Test Date: 1/28/03
 Target Location: A-PILLAR Target Code: AP1
 Horizontal Impact Angle: 150 ° Vertical Impact Angle: 39 °
 Ambient Temperature: 21 °C Time of Impact: 14:25
 Headform Number: 805

Impact Point:

Description:

Description:	From lower midpoint				
On centerline	30	mm up			
On centerline	37	-	mm right	x	mm left



Free Motion HIC: 1208.0 HIC(d): 1077.8
 Impact Velocity (kph): 23.53 HIC T1: 2.6 msec HIC T2: 5.4 msec

Post-Test Comments:

FMVSS 201U IMPACT TEST - 2003 JEEP LIBERTY C30302 - AP1

FMII Headform 805

Location: AP1

Test Date: January 28, 2003

Work File: AP1

-----TEST RESULTS-----

Lab Temperature: 21 C

HICd: 1077.8

Lab Humidity: 13 %

HIC (36ms): 1208.0

Velocity at Impact: 23.53 KPH

t1: 2.6 msec

t2: 5.4 msec

Free Flight Distance: 219.34 mm

Duration: 2.8 msec

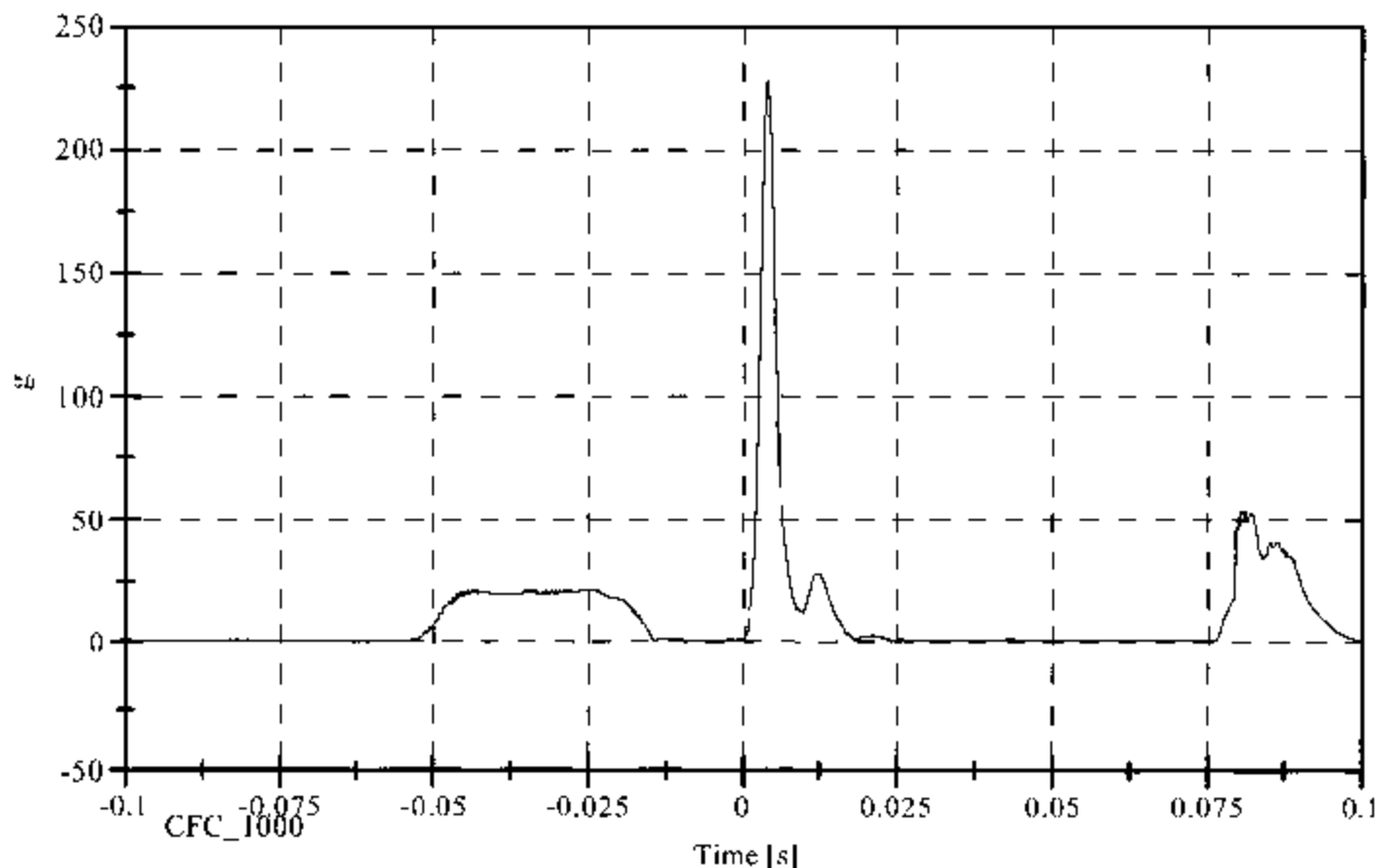
Average Acceleration: 10.9 g

FMVSS 201U IMPACT TEST - 2003 JEEP LIBERTY

Headform Resultant

Max: 227.4 [g] at 0.004 [s]

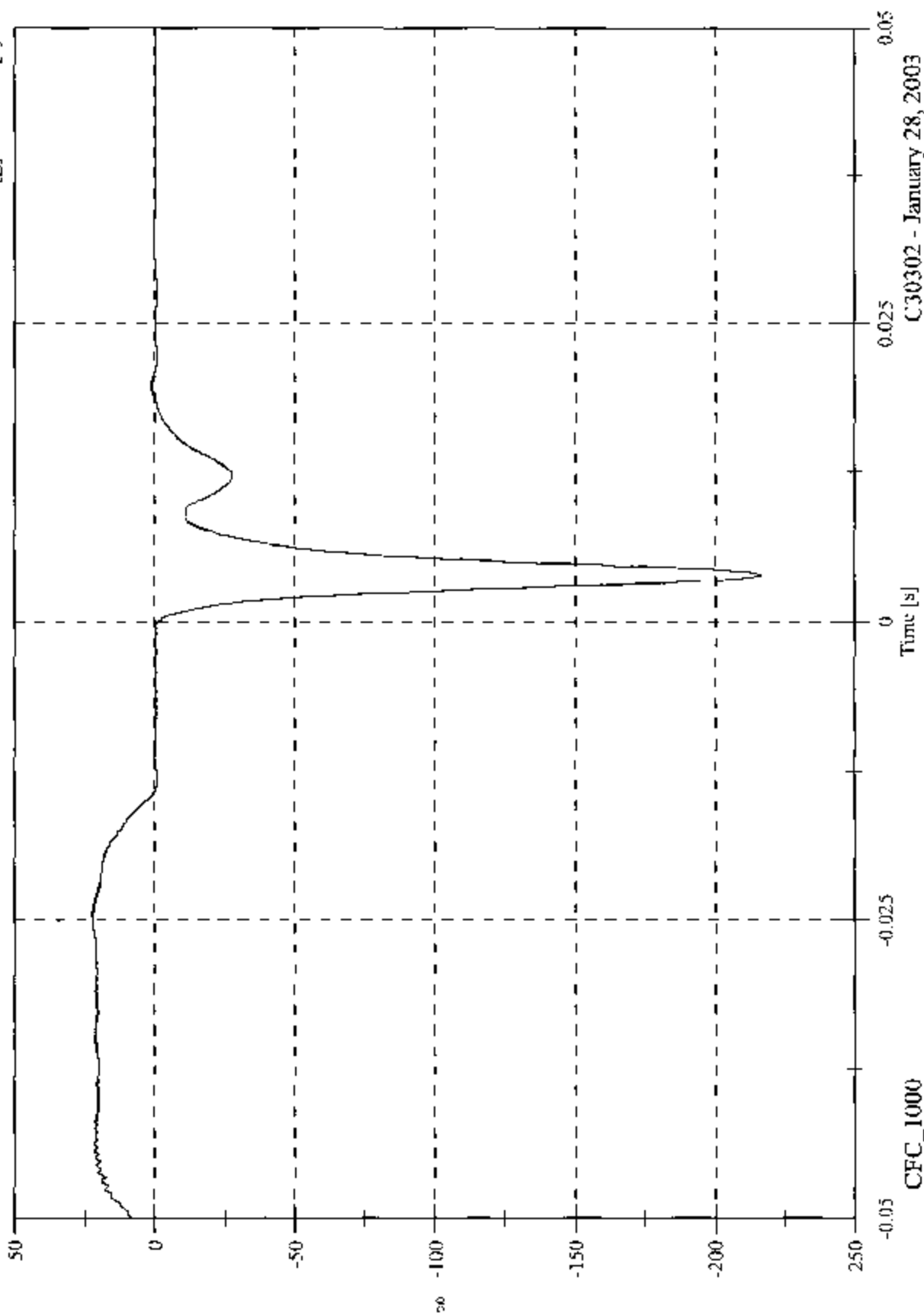
Min: -0.0 [g] at -0.099 [s]



FMVSS 2010 IMPACT TEST - 2003 JEEP LIBERTY

Headform X Acceleration

Max: 22.3 [g] at -0.025 [s]
Min: -216.3 [g] at 0.004 [s]



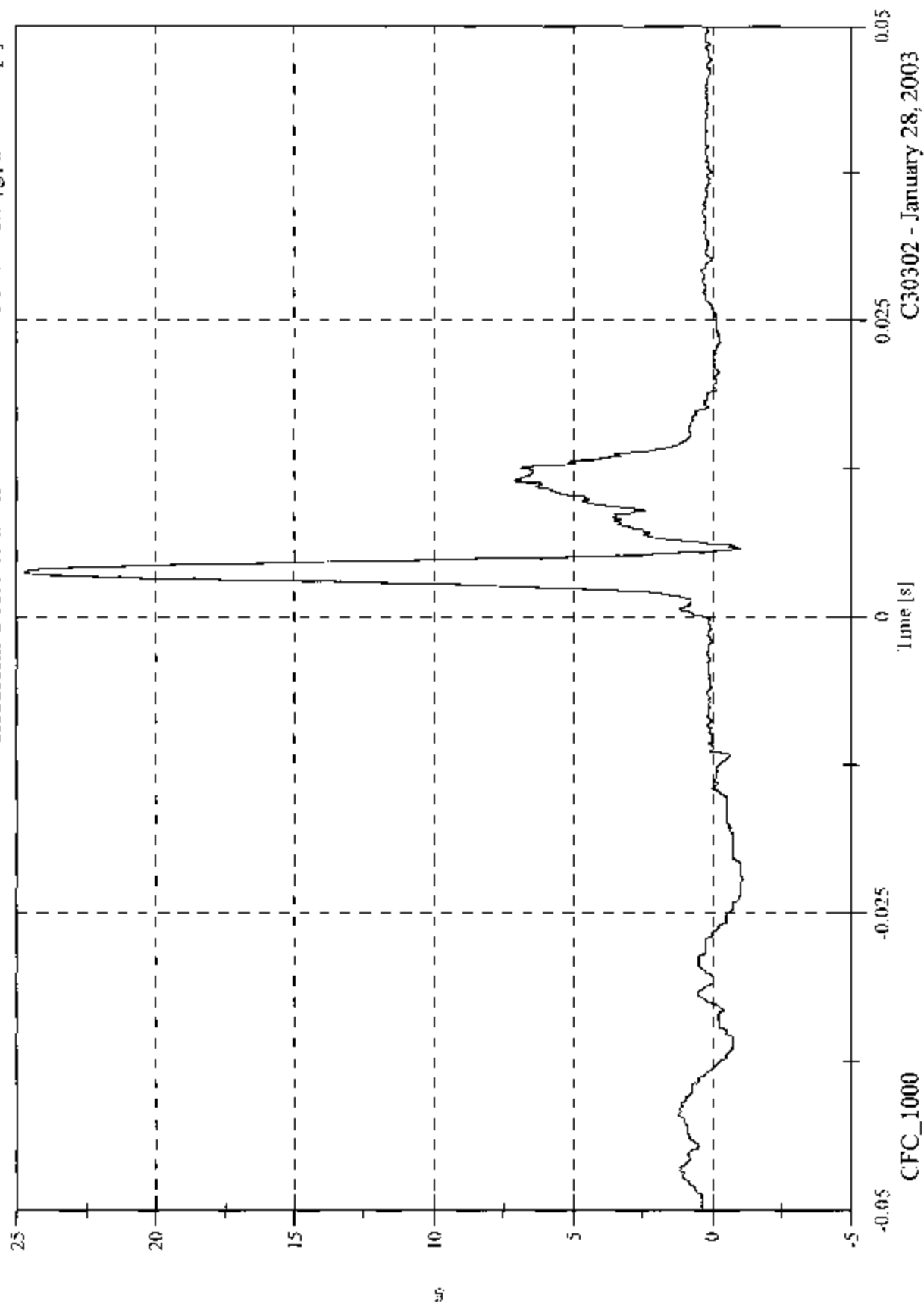
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FMVSS 201U IMPACT TEST - 2003 JEEP LIBERTY

Max: 24.7 [g] at 0.004 [s]

Min: -1.1 [g] at -0.022 [s]

Headform Y Acceleration

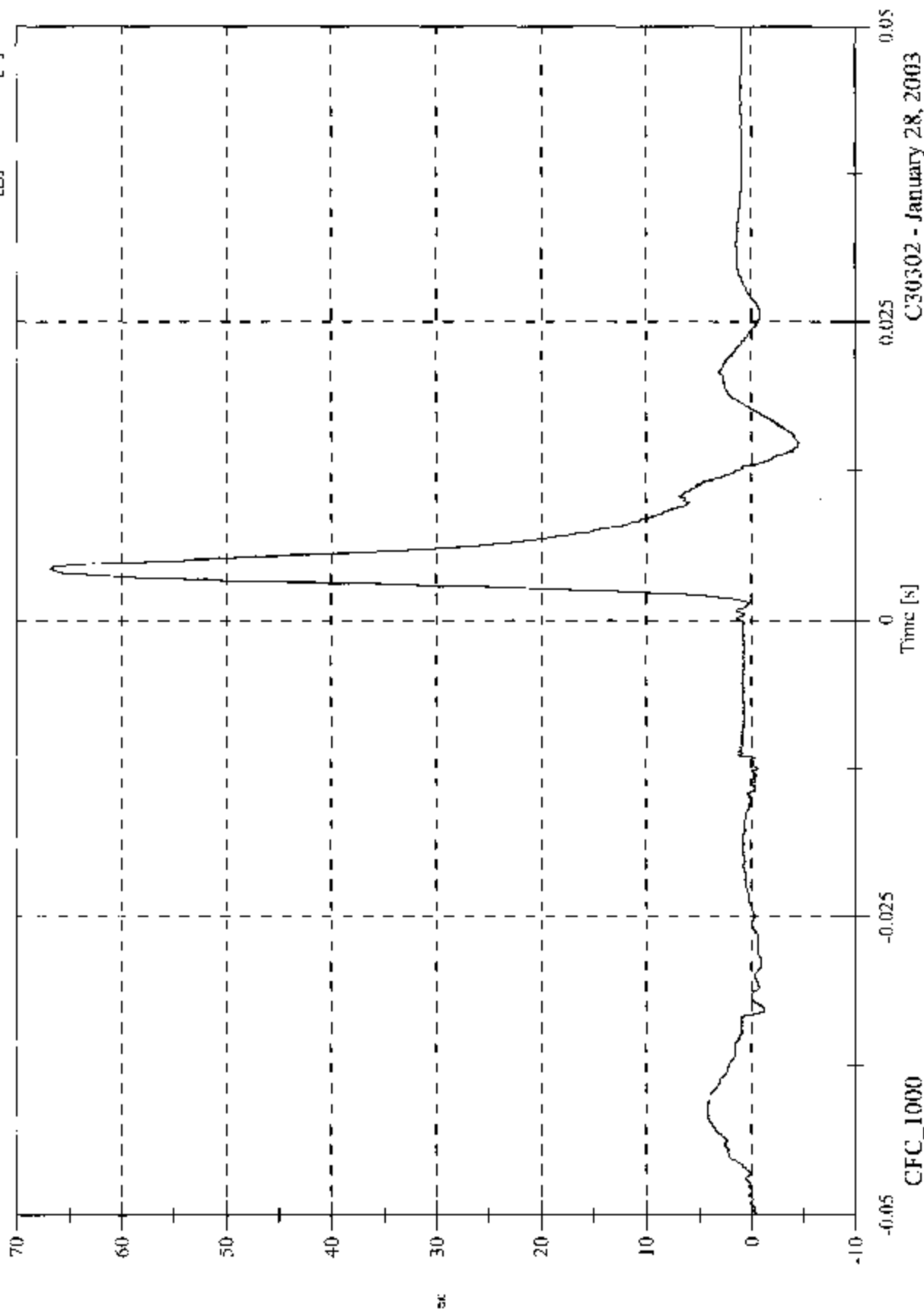


C30302 - January 28, 2003

FMVSS 201U IMPACT TEST - 2003 JEEP LIBERTY

Headform Z Acceleration

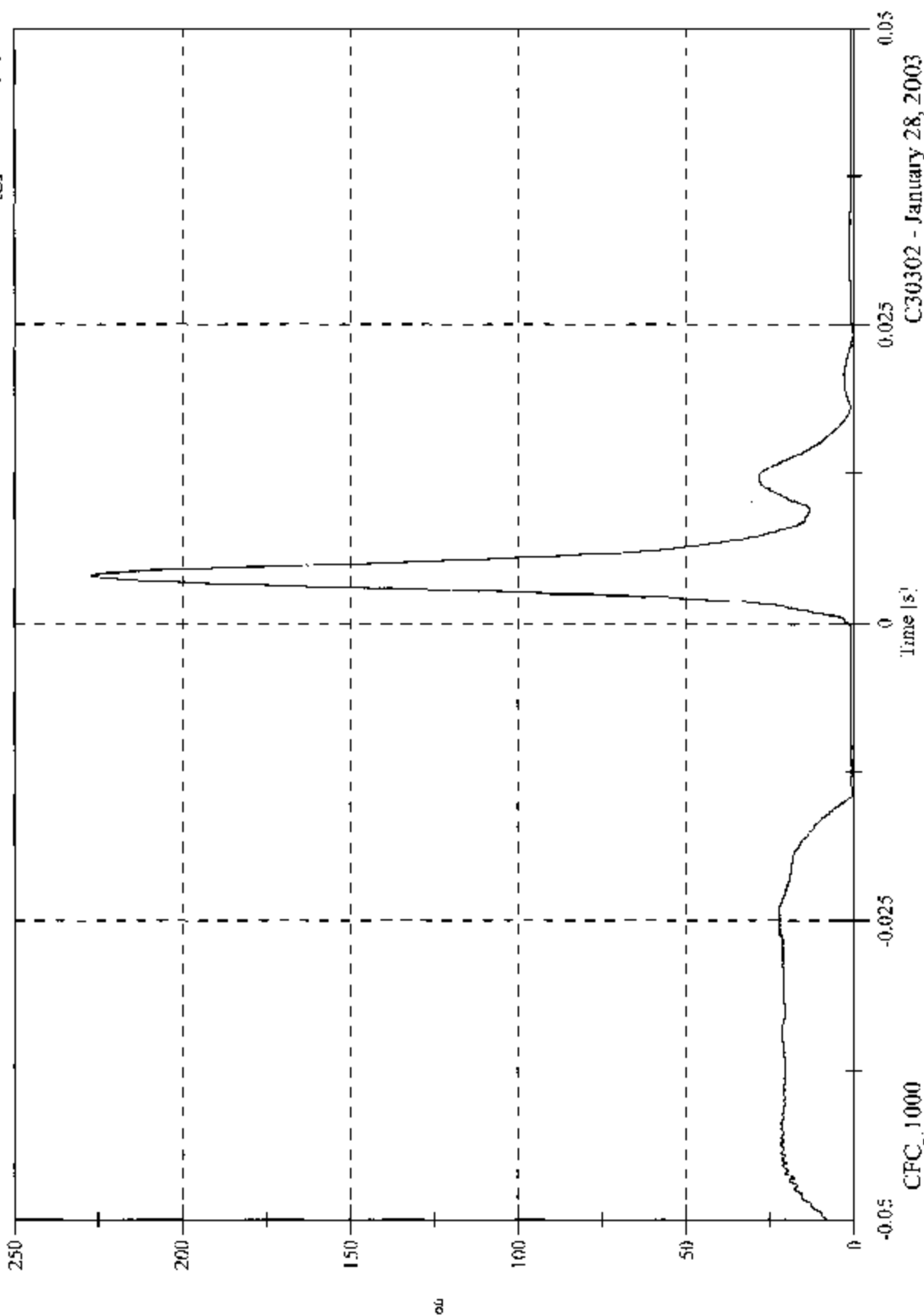
Max: 66.8 [g] at 0.004 [s]
Min: -4.6 [g] at 0.015 [s]



FMVSS 201U IMPACT TEST - 2003 JEEP LIBERTY

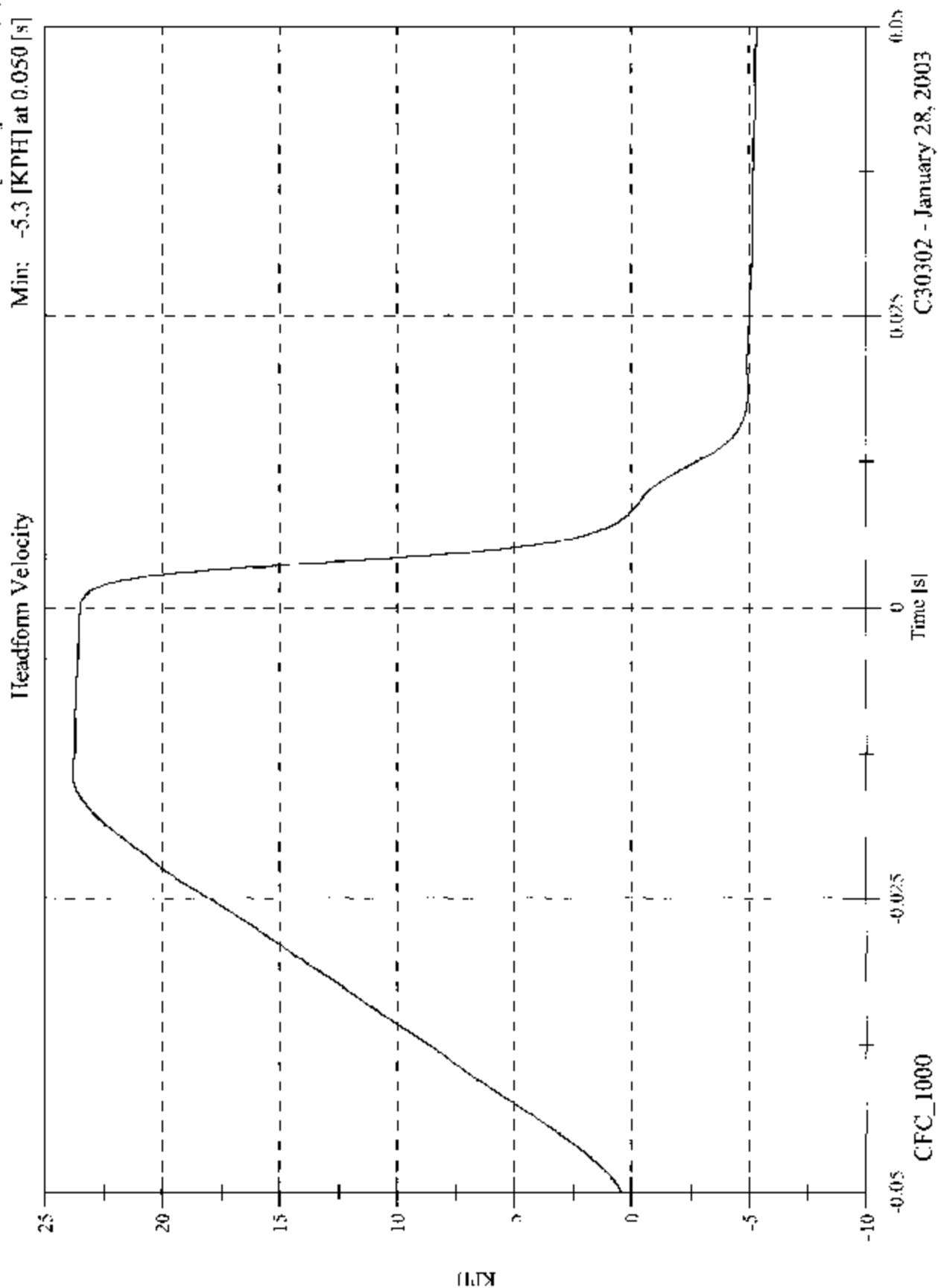
Headform Resultant

Max: 227.4 [g] at 0.004 [s]
Min: 0.3 [g] at 0.024 [s]



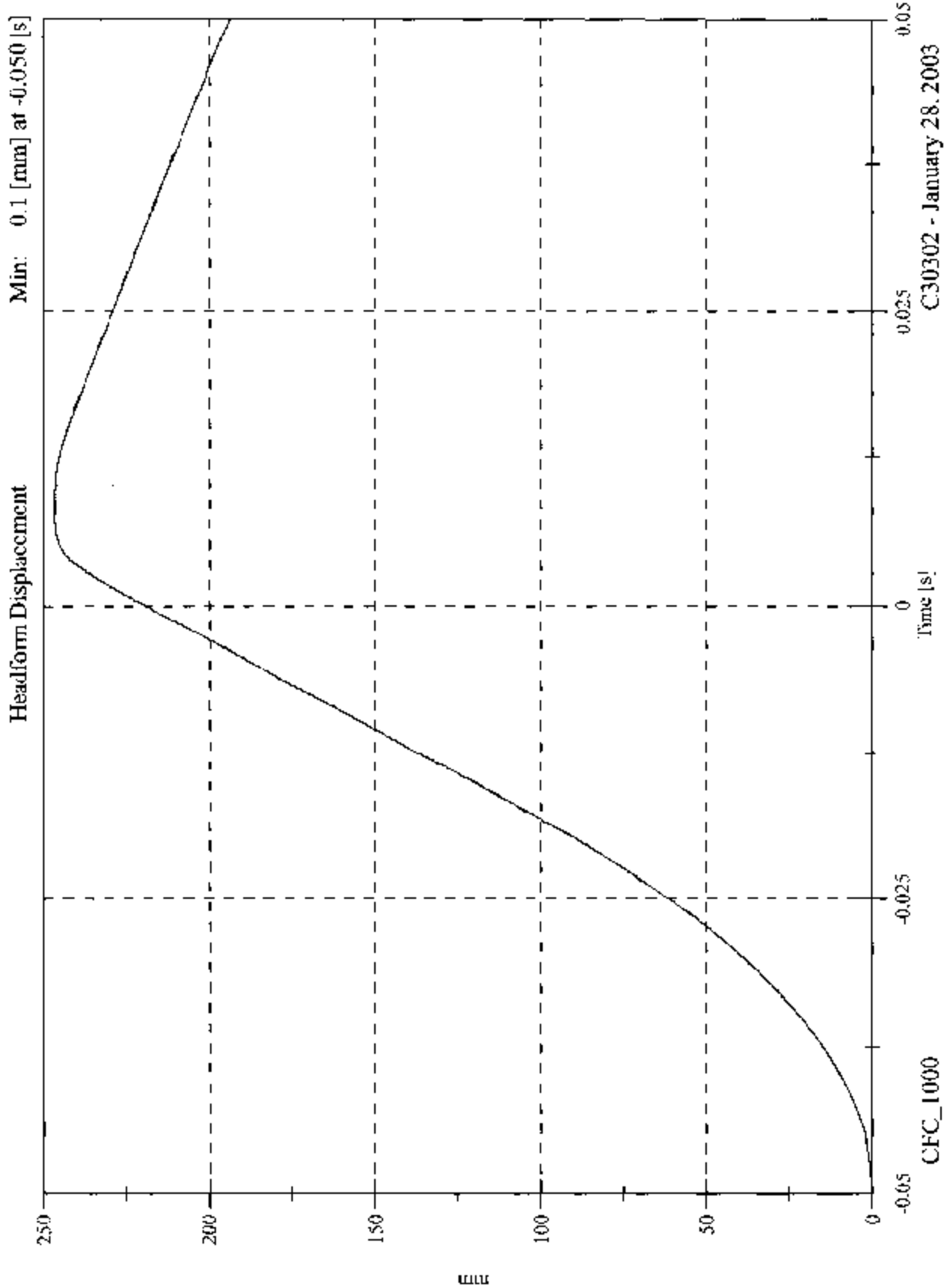
FMVSS 201J IMPACT TEST - 2003 JEEP LIBERTY

Max: 23.8 [KPH] at -0.014 [s]
 Min: -5.3 [KPH] at 0.050 [s]



C30302 PASSENGER SIDE API IMPACT PLOT #5

FMVSS 201U IMPACT TEST - 2003 JEEP LIBERTY



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C30302 PASSENGER SIDE AP1 IMPACT PLOT #6

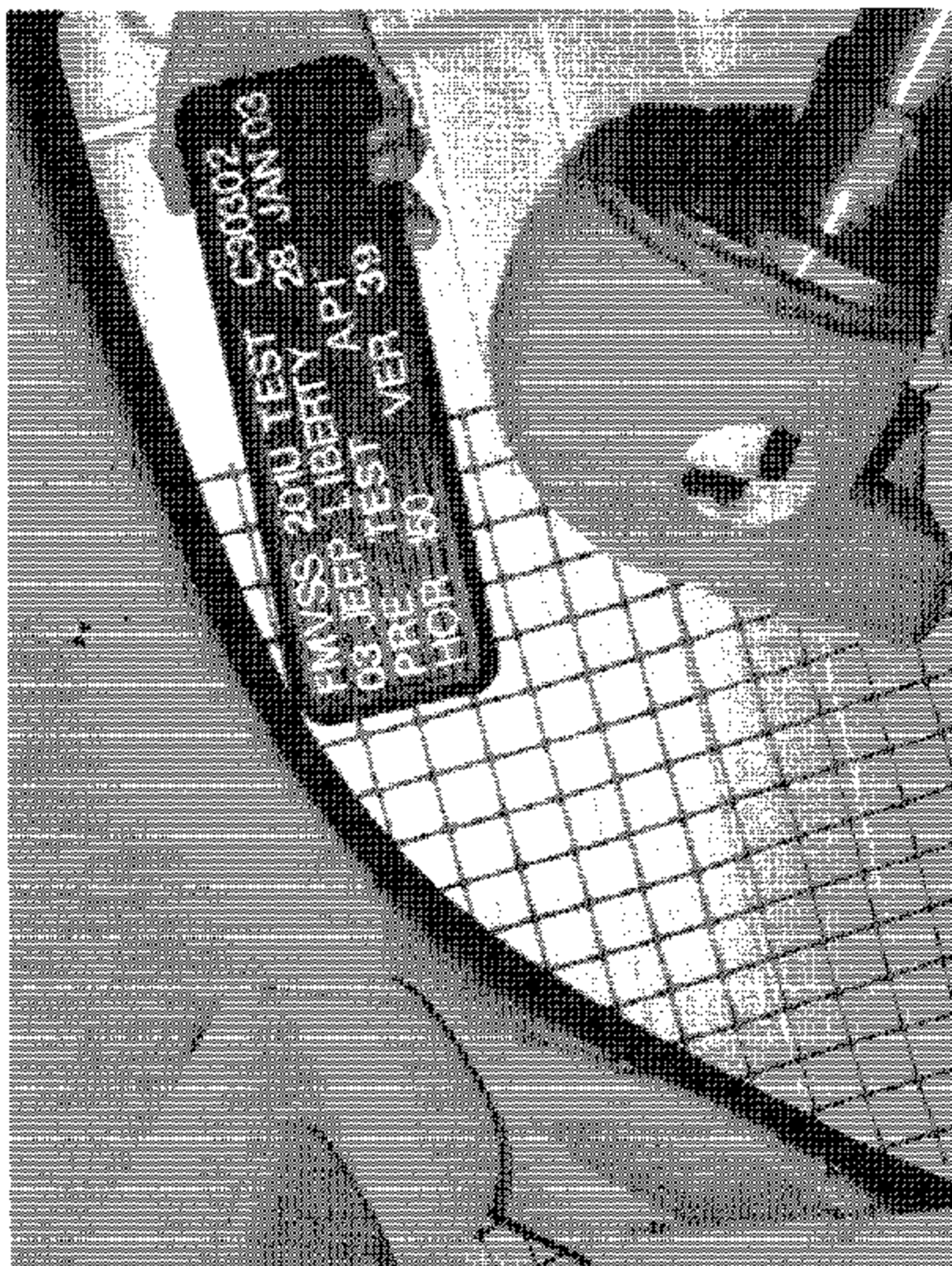


Figure 1: PRE-TEST API

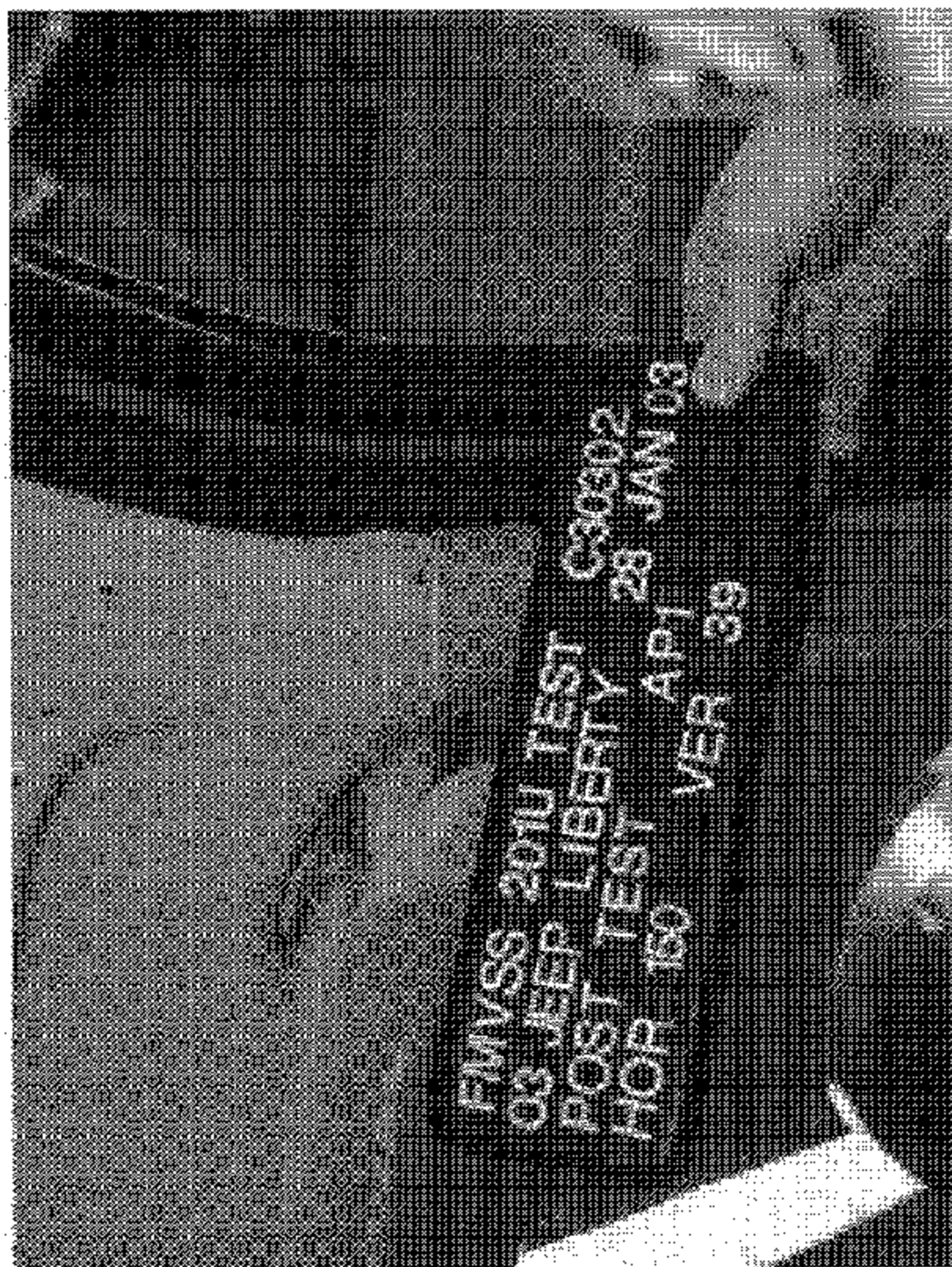


Figure : POST-TEST API

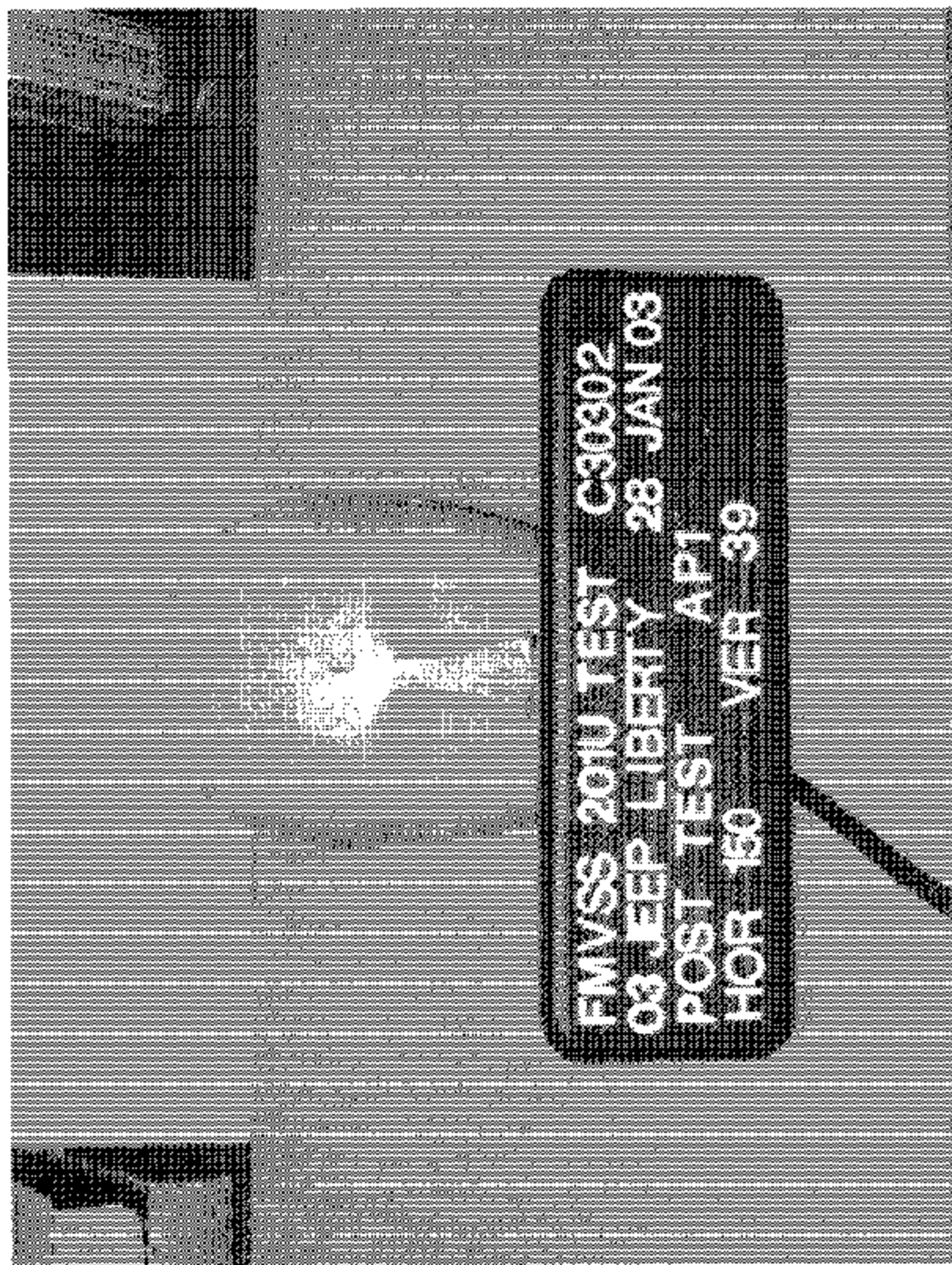


Figure 1. API HEADFORM

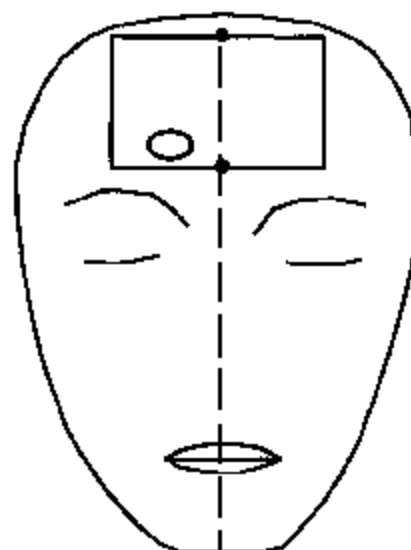
Year/Make/Model/Body Style: 2003 Jeep Liberty 4-door
 Vehicle Body Color: Red VIN: 1J4GL48183W539150
 Vehicle NHTSA No.: C30302 Month & Year of Manufacture: 9/2002

Test Number: 5 Test Date: 1/28/03
 Target Location: SIDE RAIL Target Code: SR2A
 Horizontal Impact Angle: 90 ° Vertical Impact Angle: 33 °
 Ambient Temperature: 21 °C Time of Impact: 16:05
 Headform Number: 1255

Impact Point:

Description:

Description:	From lower midpoint				
On centerline	12	mm up			
On centerline	7	x	mm right	-	mm left



Free Motion HIC: 776.8 HIC(d): 752.8
 Impact Velocity (kph): 23.45 HIC(t) 3.0 msec: HIC2 10.1 msec

Post-Test Comments:

FMVSS 201U IMPACT TEST - 2003 JEEP LIBERTY C30302 - SR2A

FMH Headform 1255

Location: SR2A

Test Date: January 28, 2003

Work File: SR2A

-----TEST RESULTS-----

Lab Temperature: 21 C

HICd: 752.5

Lab Humidity: 13 %

HIC (36ms): 776.8

Velocity at Impact: 23.45 KPH

t1: 3.0 msec

t2: 10.1 msec

Free Flight Distance: 215.41 mm

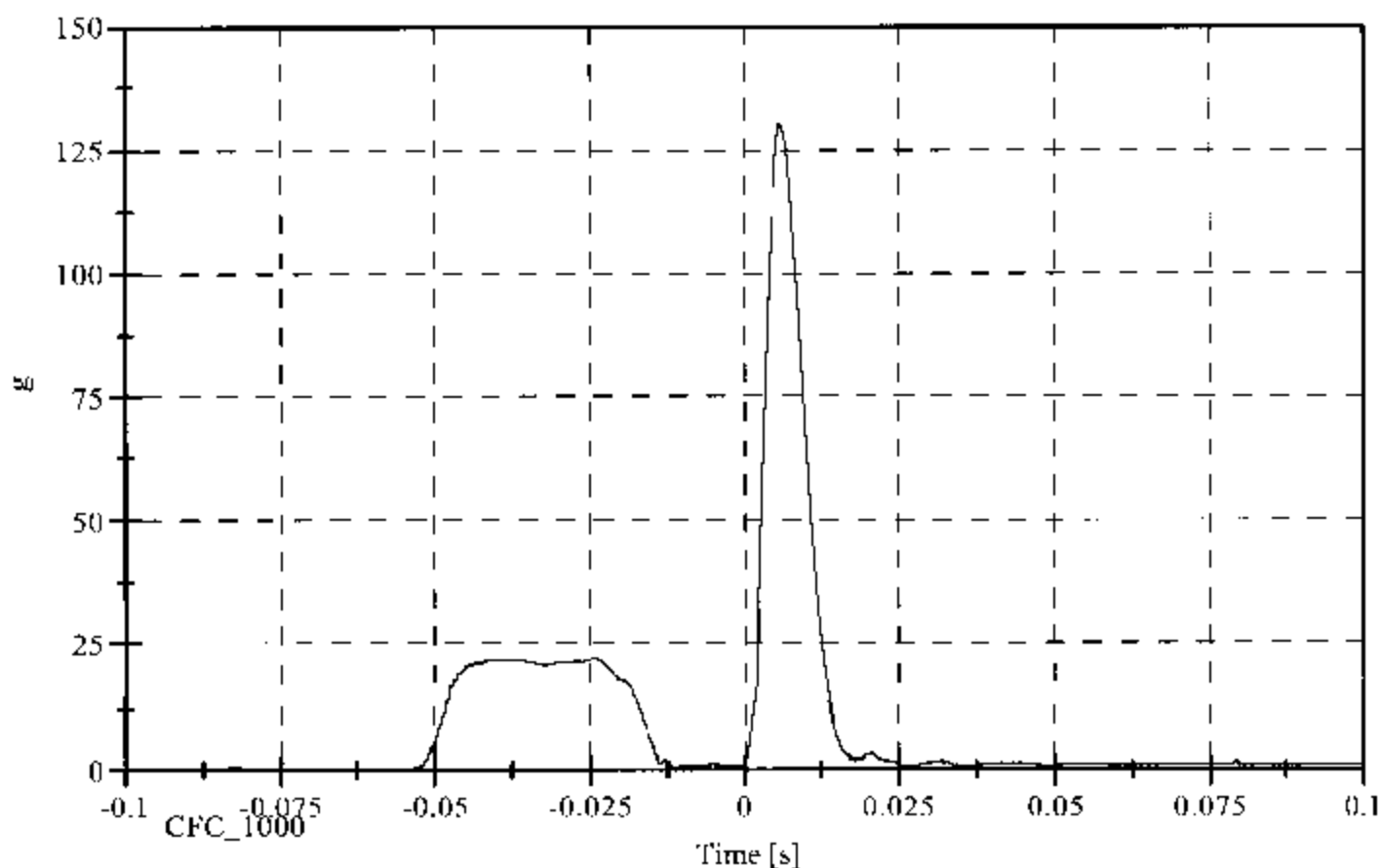
Duration: 7.0 msec

Average Acceleration: 8.7 g

FMVSS 201U IMPACT TEST - 2003 JEEP LIBERTY
Headform Resultant

Max: 130.0 [g] at 0.006 [s]

Min: 0.0 [g] at -0.086 [s]

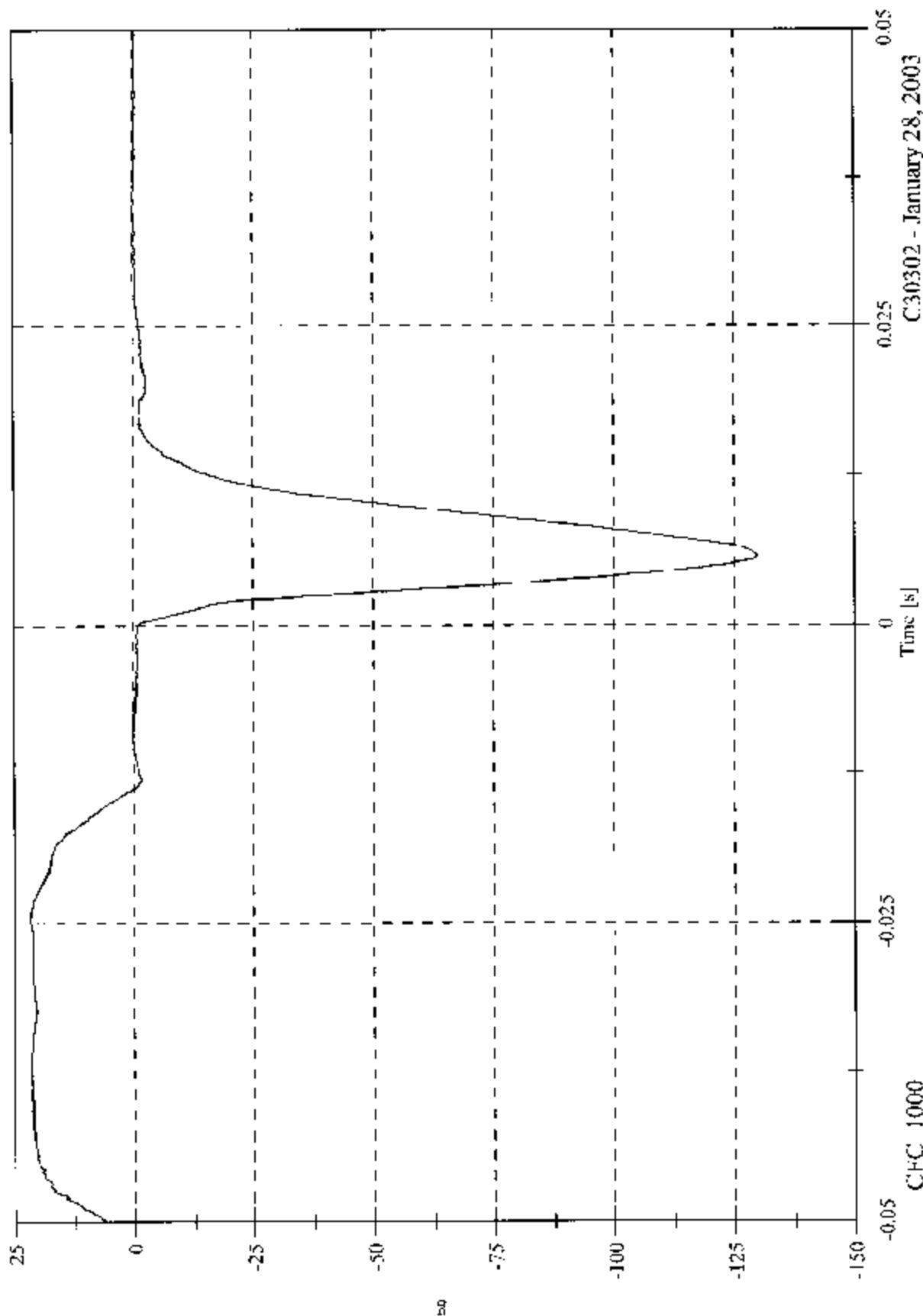


FMVSS 201U IMPACT TEST - 2003 JEEP LIBERTY

Headform X Acceleration

Max: 21.8 [g] at -0.025 [s]

Min: -129.6 [g] at 0.006 [s]



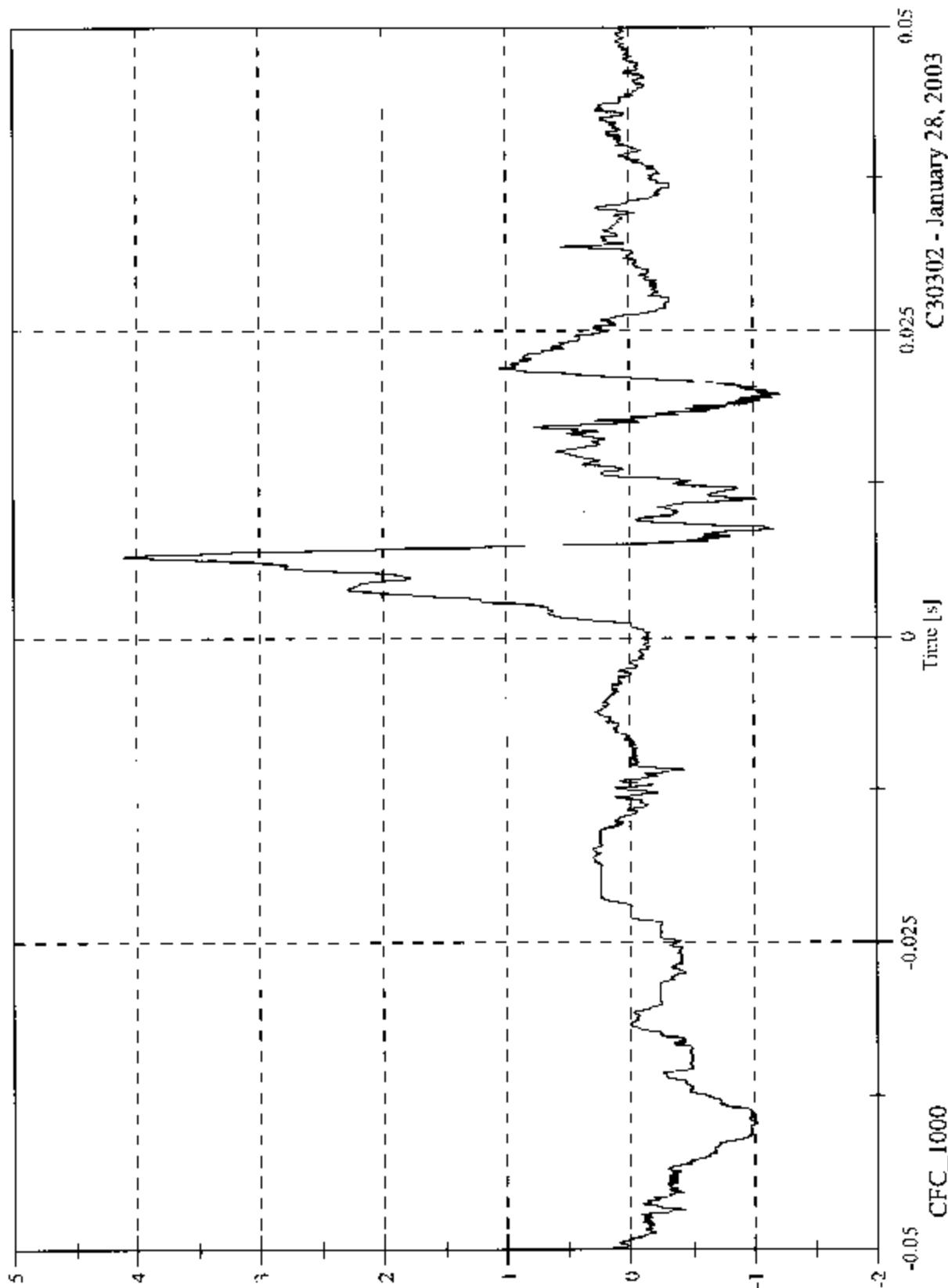
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FMVSS 201C IMPACT TEST - 2003 JEEP LIBERTY

Headform Y Acceleration

Max: 4.1 [g] at 0.007 [s]

Min: -1.2 [g] at 0.020 [s]

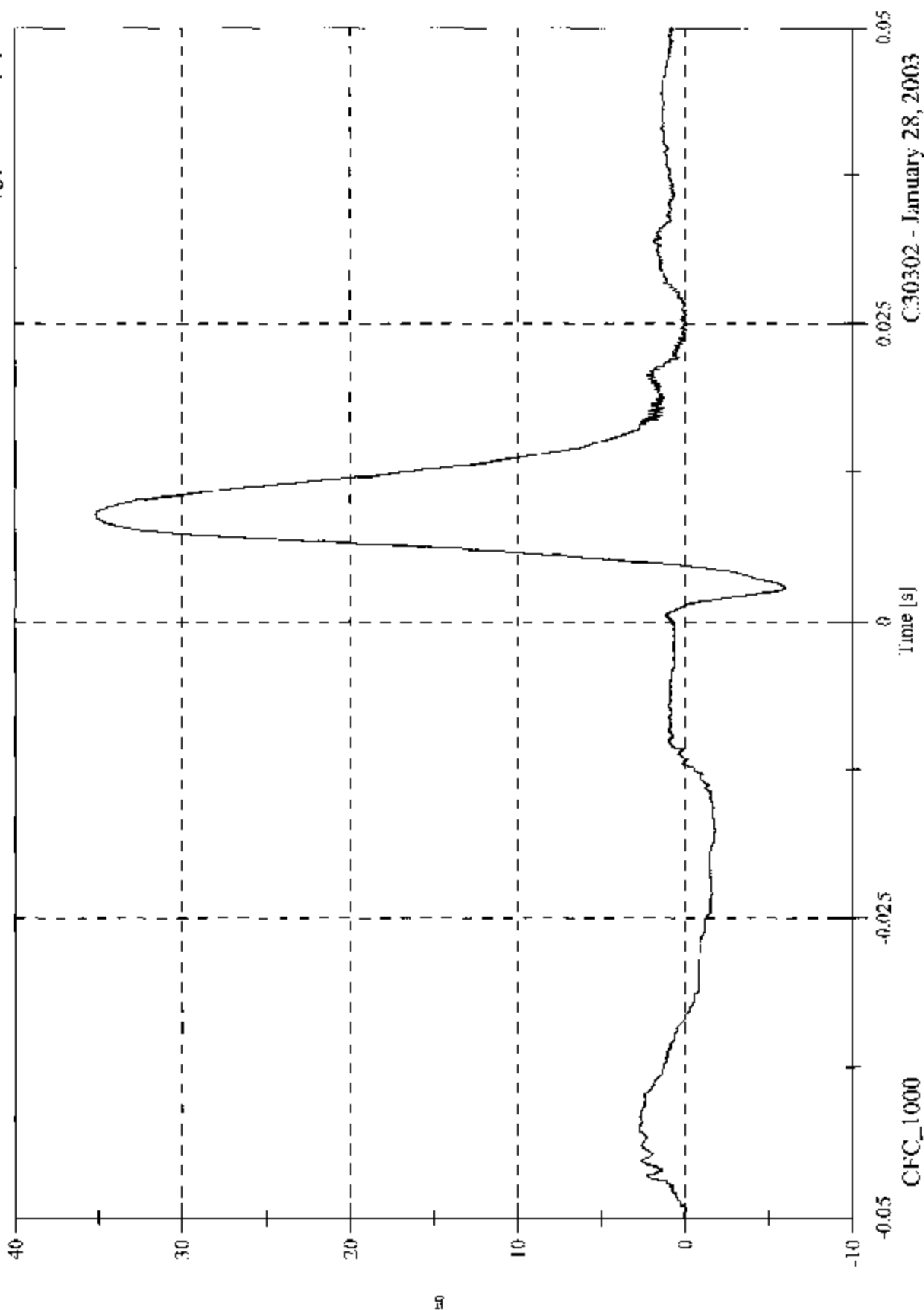


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FMVSS 201U IMPACT TEST - 2003 JEEP LIBERTY

Headform Z Acceleration

Max: 35.2 [g] at 0.009 [s]
Min: -6.0 [g] at 0.003 [s]



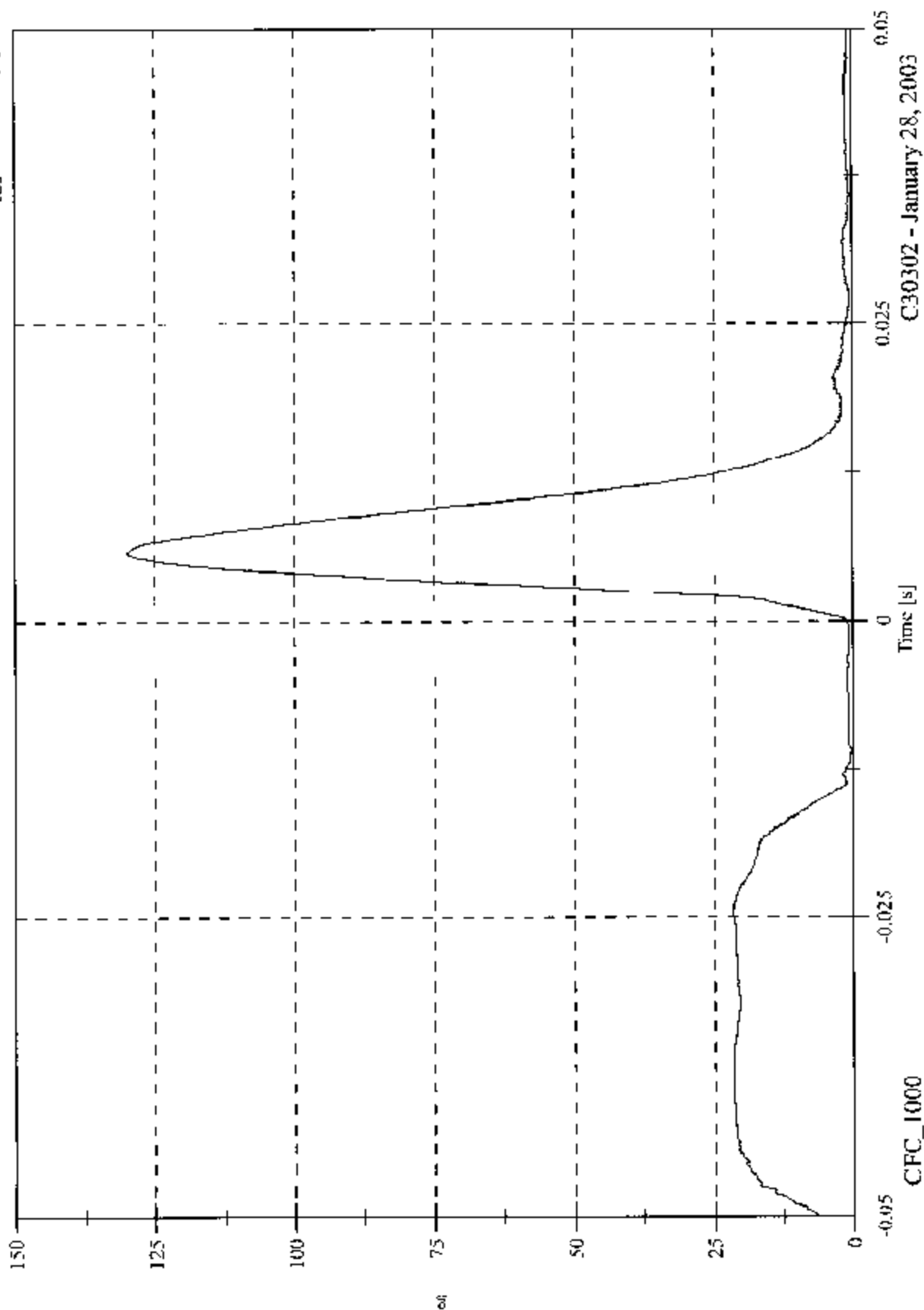
C30302 - January 28, 2003

FMVSS 2010 IMPACT TEST - 2003 JEEP LIBERTY

Headform Resultant

Max: 130.0 [g] at 0.006 [s]

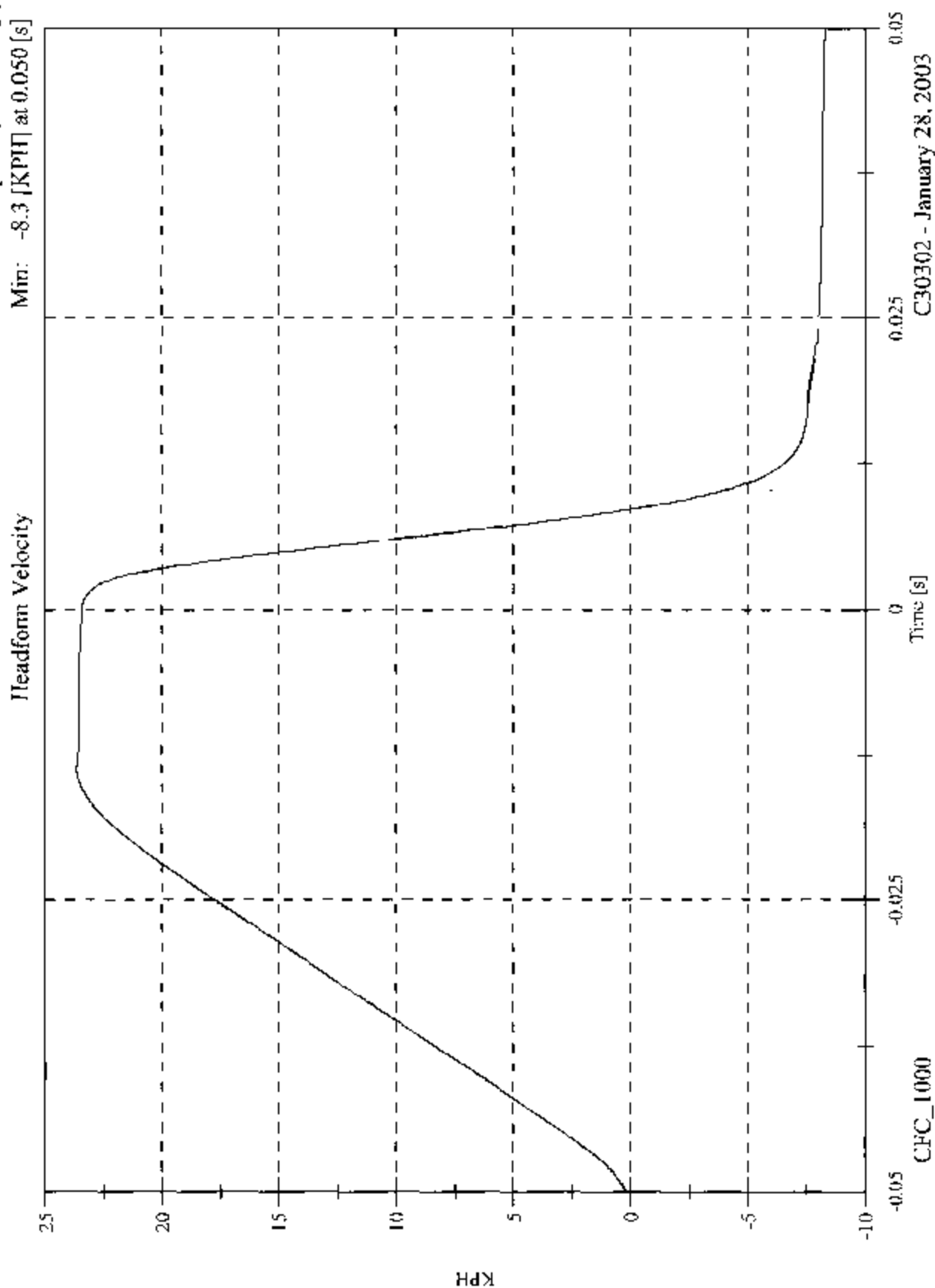
Min: 0.5 [g] at -0.011 [s]



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FMVSS 201U IMPACT TEST - 2003 JEEP LIBERTY

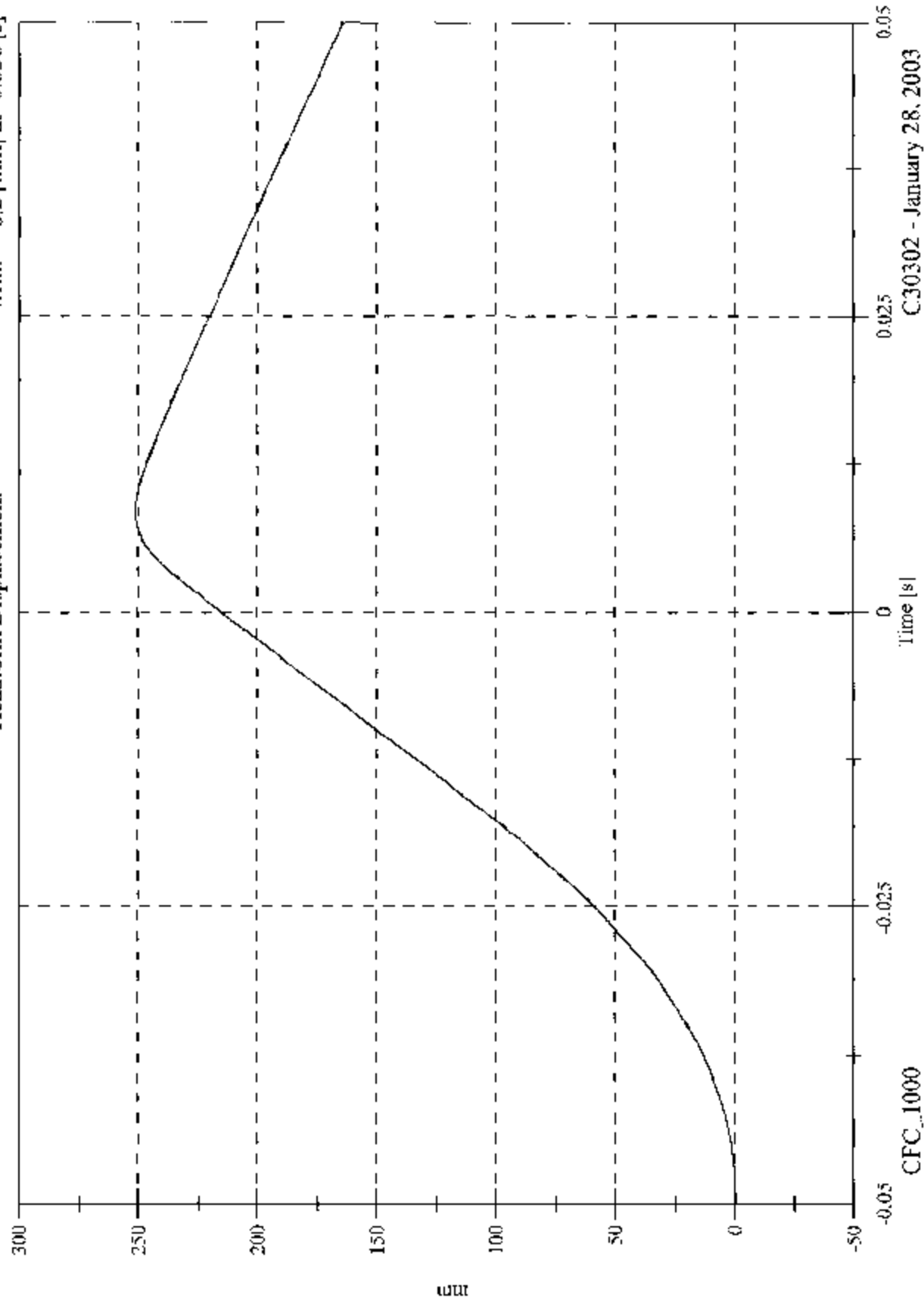
Max: 23.7 [KPH] at -0.014 [s]
 Min: -8.3 [KPH] at 0.050 [s]



FMVSS 201U IMPACT TEST - 2003 JEEP LIBERTY

Headform Displacement

Max: 251.4 [mm] at 0.009 [s]
Min: -0.2 [mm] at -0.050 [s]



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Figure - PRE-TEST SR2A

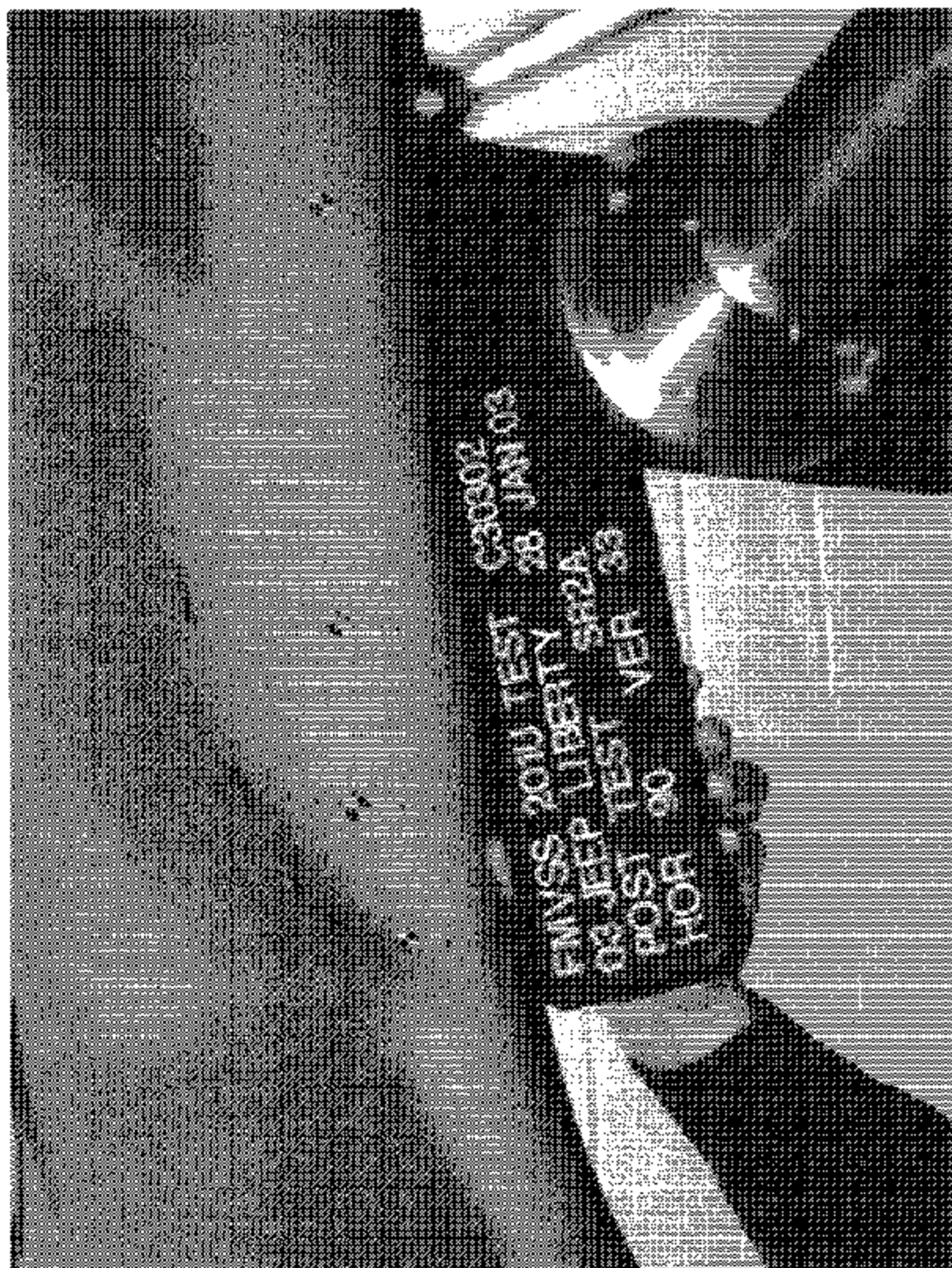


Figure 1. POST-TEST SRCA

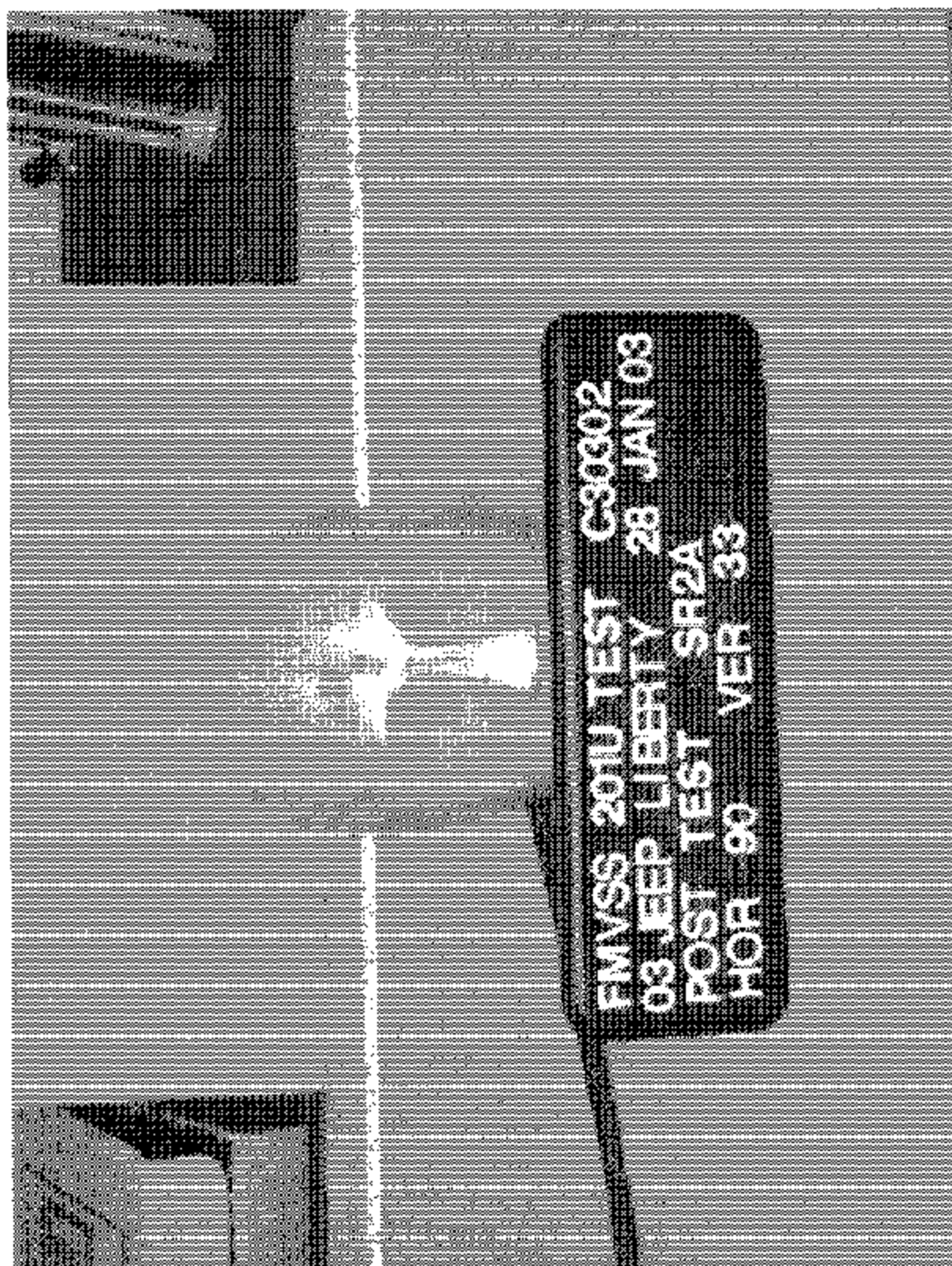


Figure 1: SR2A HEADFORM

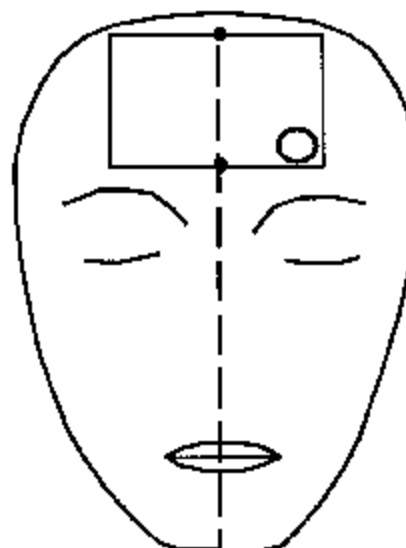
Year/Make/Model/Body Style: 2003 Jeep Liberty 4-door
 Vehicle Body Color: Red VIN: 1J4GL48183W539150
 Vehicle NHTSA No.: C30302 Month & Year of Manufacture: 9/2002

Test Number: 6 Test Date: 1/28/03
 Target Location: UPPER ROOF Target Code: URRP
 Horizontal Impact Angle: 50 ° Vertical Impact Angle: 25
 Ambient Temperature: 21 °C Time of Impact: 16:50
 Headform Number: 0355

Impact Point:

Description:

Description:	From lower midpoint				
On centerline	15	mm up			
On centerline	24	-	mm right	x	mm left



Free Motion HIC: 178.7 HIC(d): 301.2
 Impact Velocity (kph): 23.46 HIC1: 1.9 msec HIC2: 16.9 msec

Post-Test Comments:

FMVSS 201U IMPACT TEST - 2003 JEEP LIBERTY C30302 - URRP

FMH Headform 0355

Location: URRP

Test Date: January 28, 2003

Work File: URRP

-----TEST RESULTS-----

Lab Temperature: 21 C

HICd: 301.2

Lab Humidity: 13 %

HIC (36ms): 178.7

Velocity at Impact: 23.46 KPH

t1: 1.9 msec

t2: 16.9 msec

Free Flight Distance: 224.20 mm

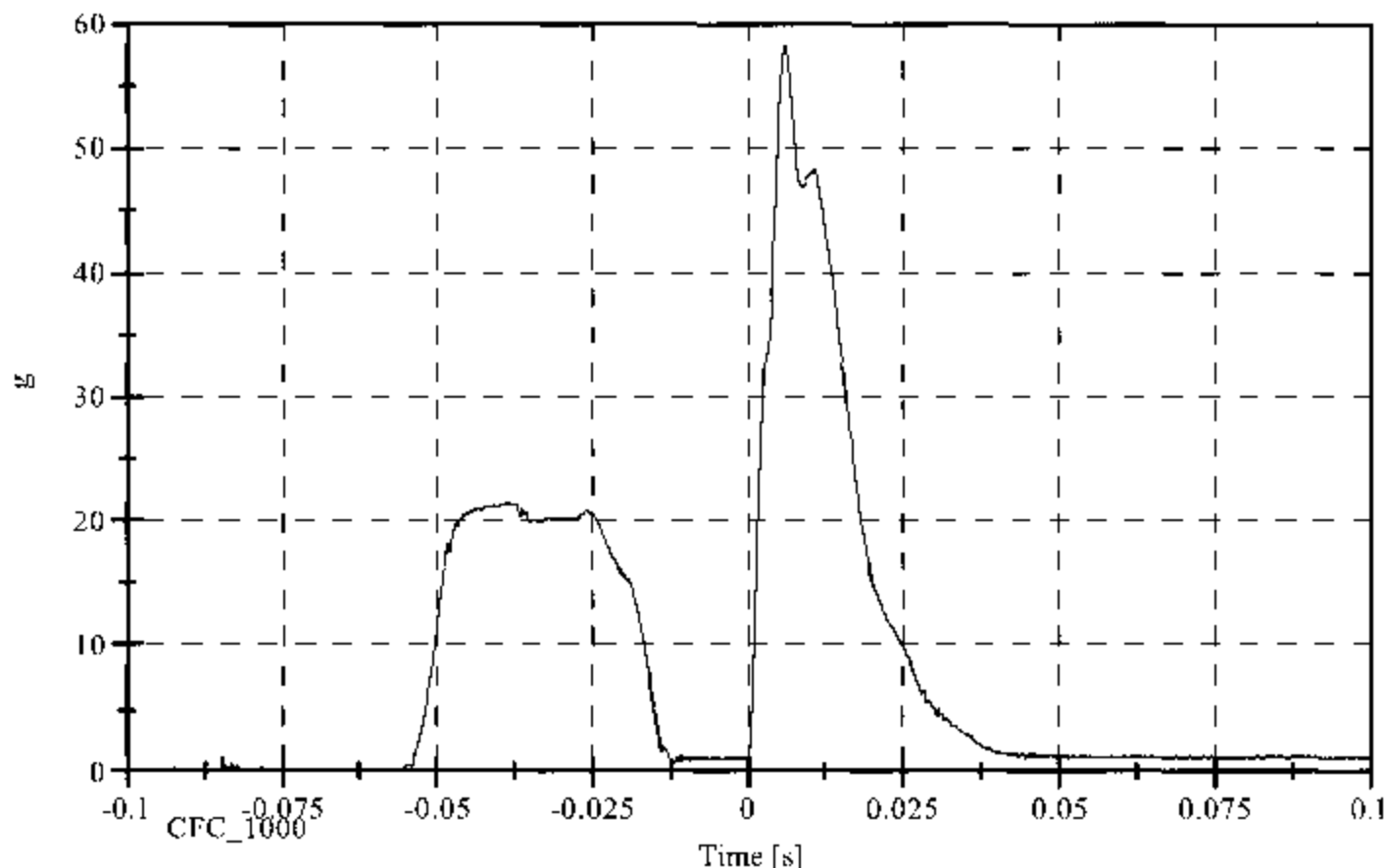
Duration: 14.9 msec

Average Acceleration: 8.1 g

FMVSS 201U IMPACT TEST - 2003 JEEP LIBERTY
Headform Resultant

Max: 58.1 [g] at 0.006 [s]

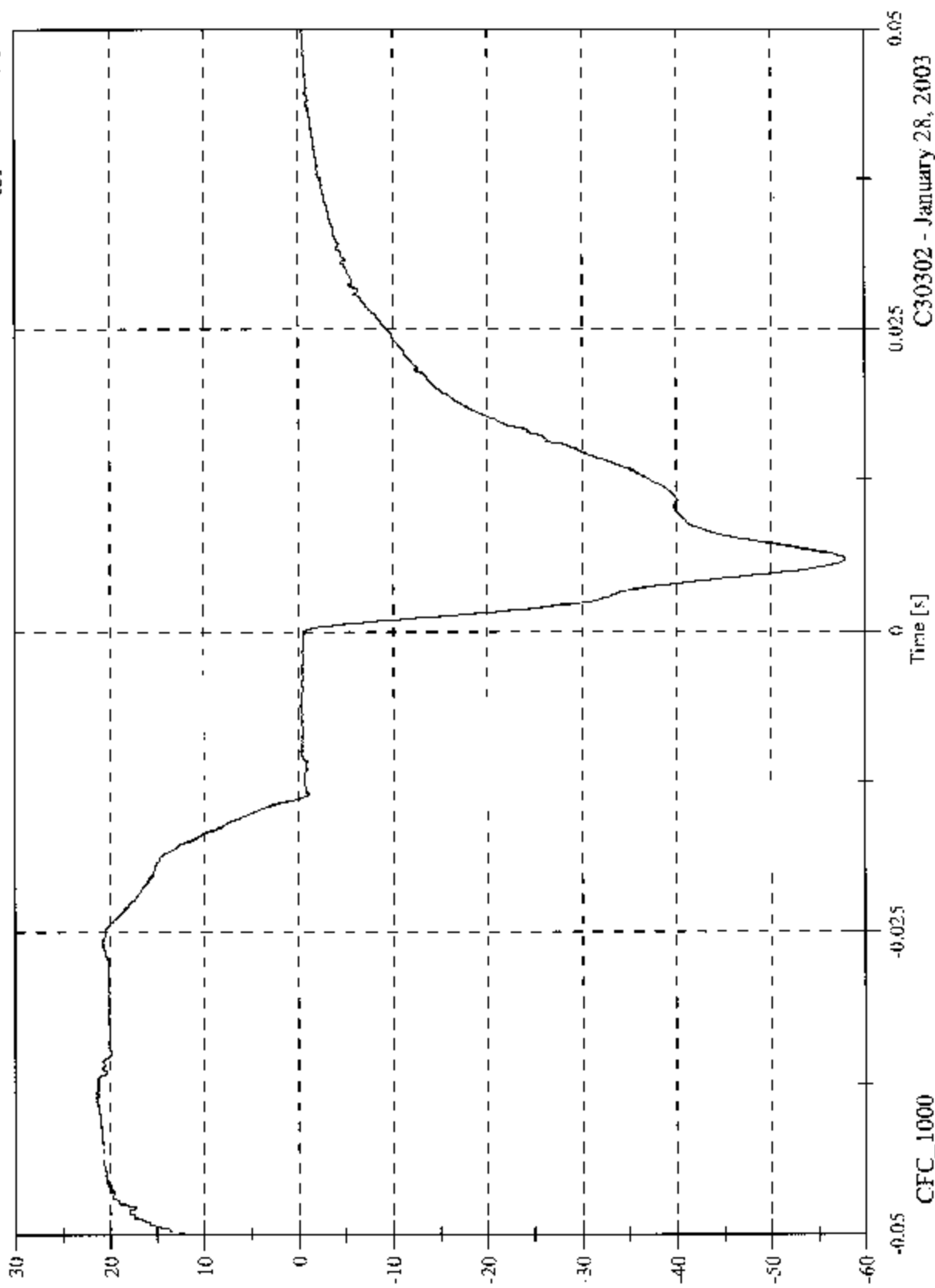
Min: 0.0 [g] at -0.071 [s]



FMVSS 201C IMPACT TEST - 2003 JEEP LIBERTY

Headform X Acceleration

Max: 21.4 [g] at -0.039 [s]
Min: -57.8 [g] at 0.006 [s]

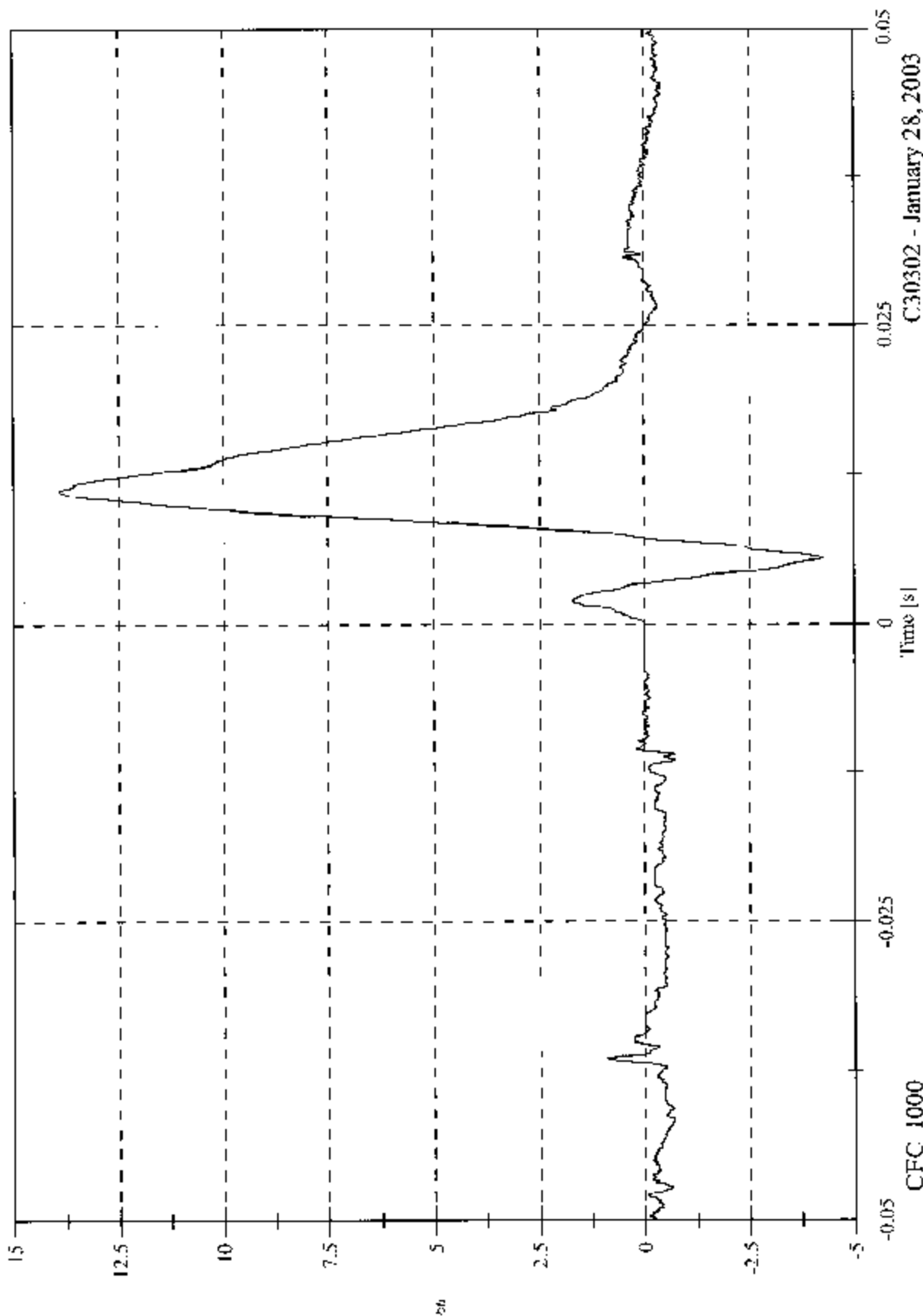


C30302 - January 28, 2003

FMVSS 201C IMPACT TEST - 2003 JEEP LIBERTY

Headform Y Acceleration

Max: 13.9 [g] at 0.011 [s]
Min: -4.3 [g] at 0.006 [s]

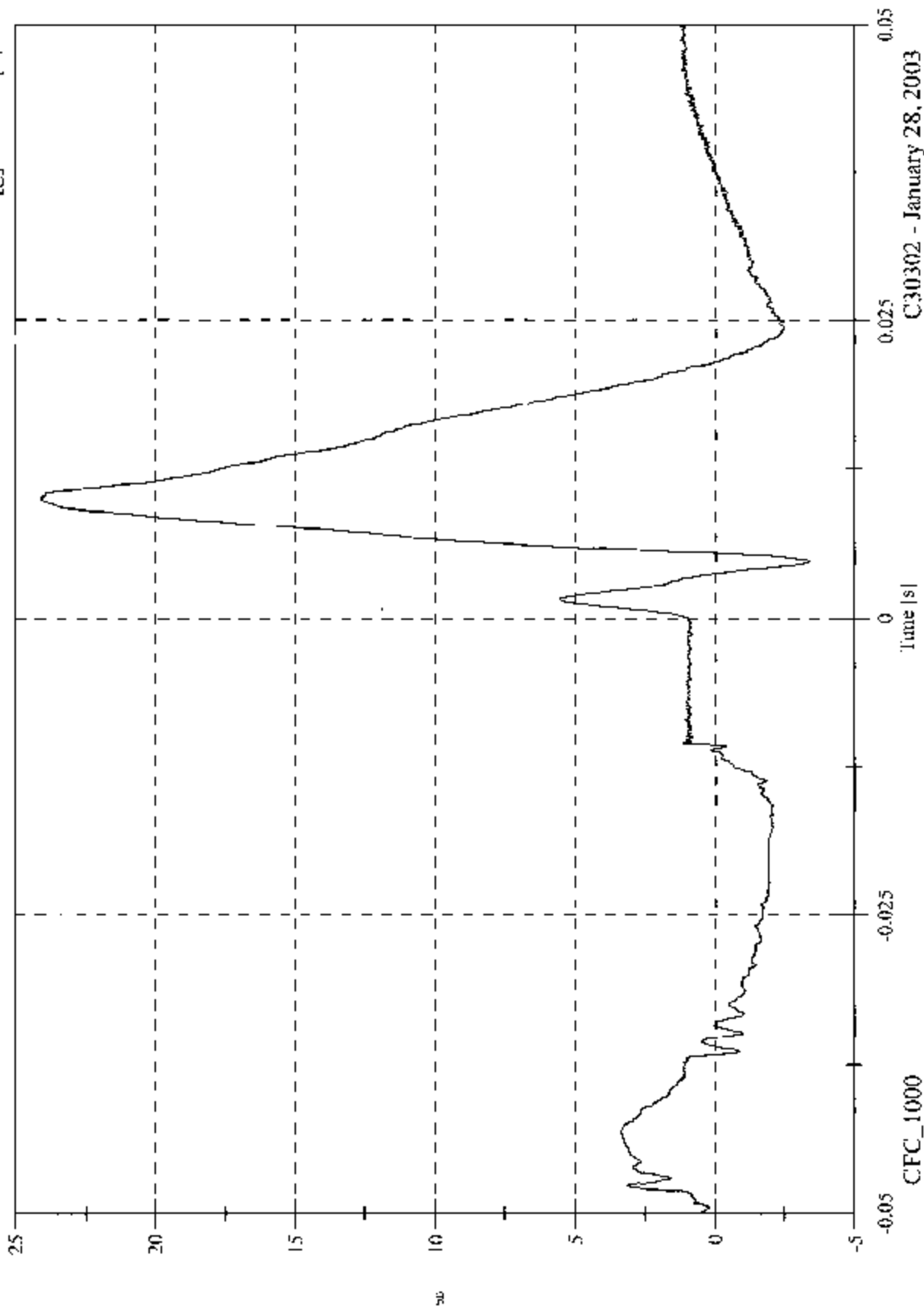


C30302 - January 28, 2003

FMVSS 201U IMPACT TEST - 2003 JEEP LIBERTY

Headform Z Acceleration

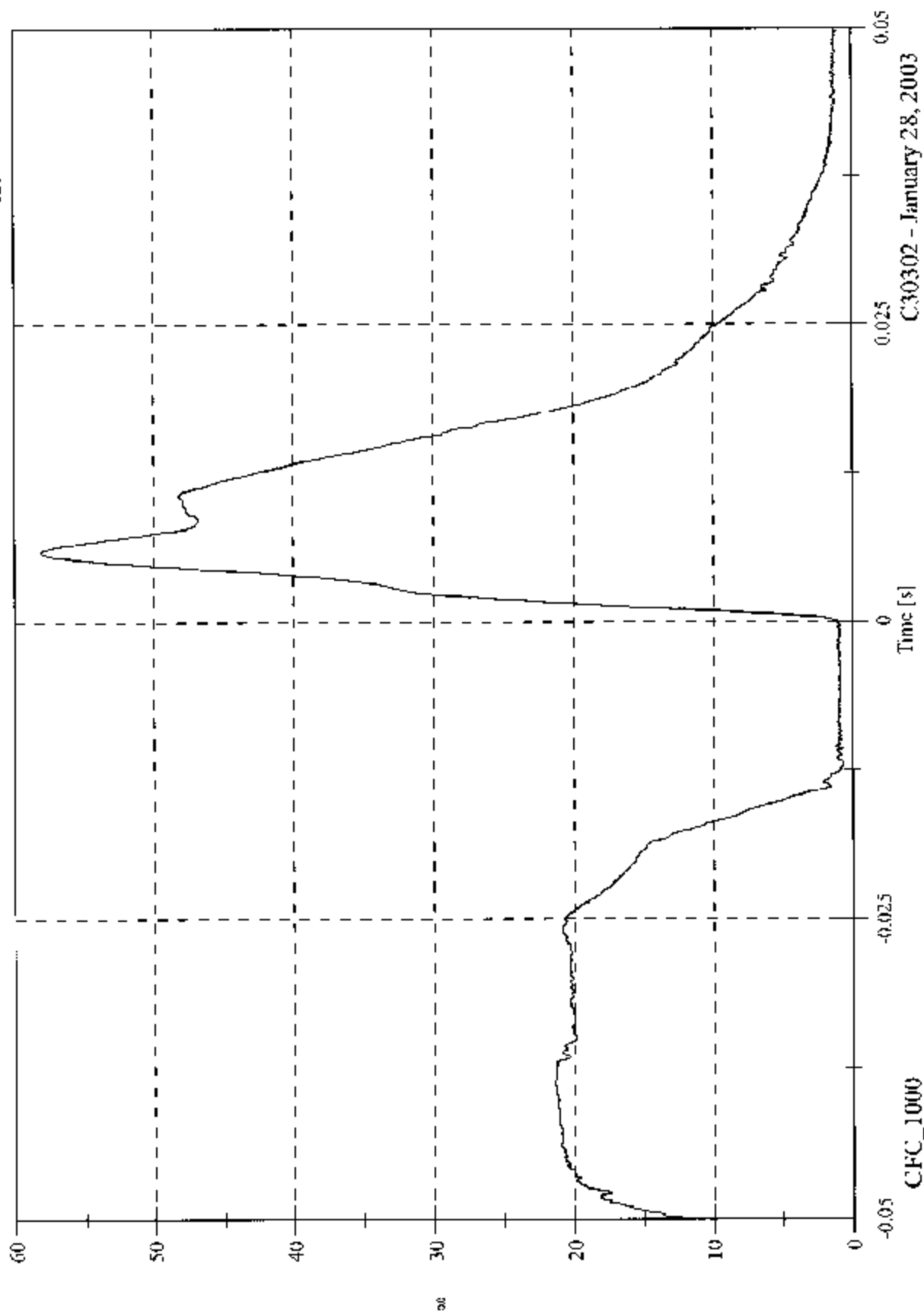
Max: 24.1 [g] at 0.010 [s]
Min: -3.4 [g] at 0.005 [s]



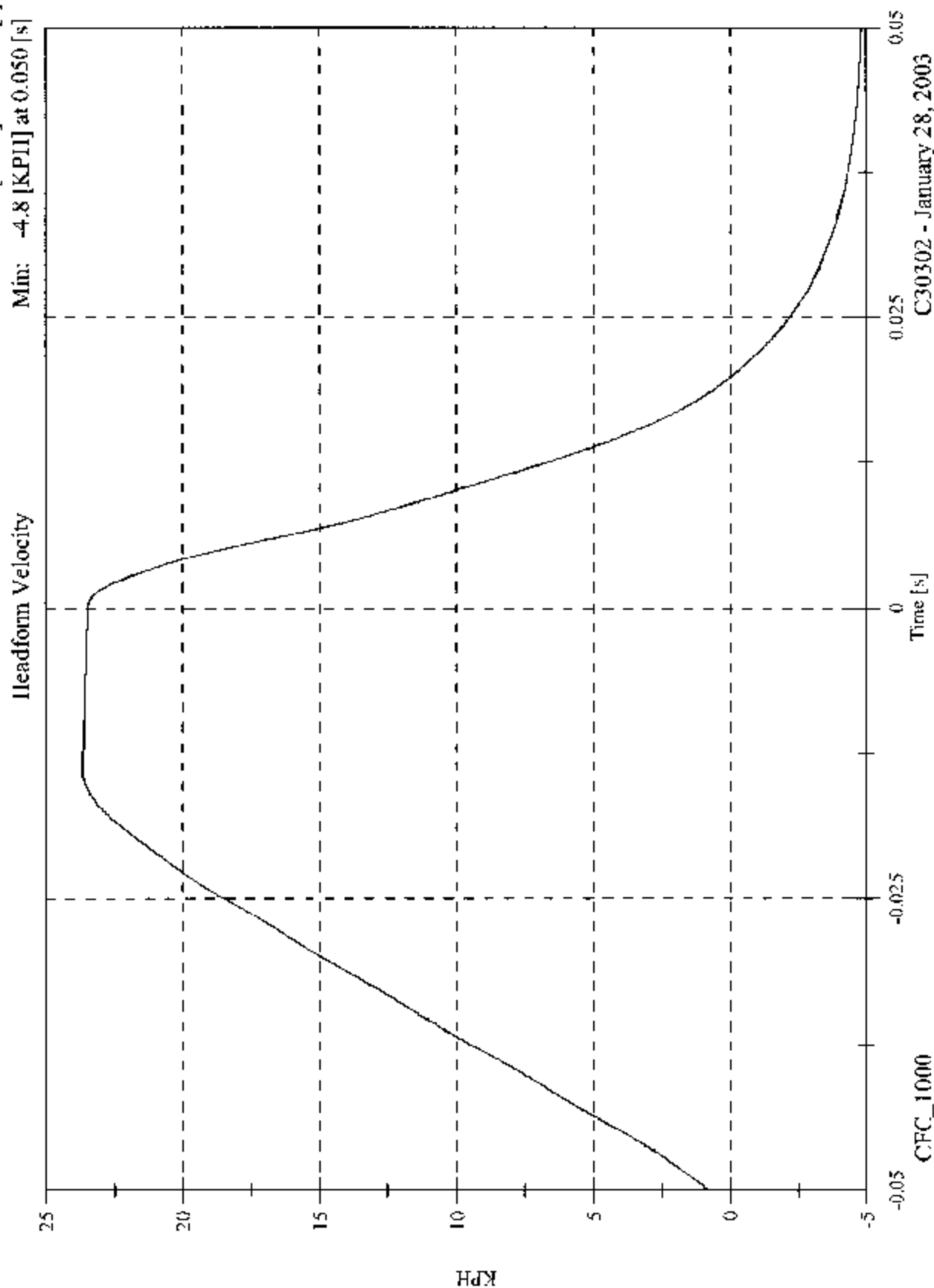
FMVSS 201U IMPACT TEST - 2003 JEEP LIBERTY

Headform Resultant

Max: 58.1 [g] at 0.006 [s]
Min: 0.7 [g] at -0.012 [s]



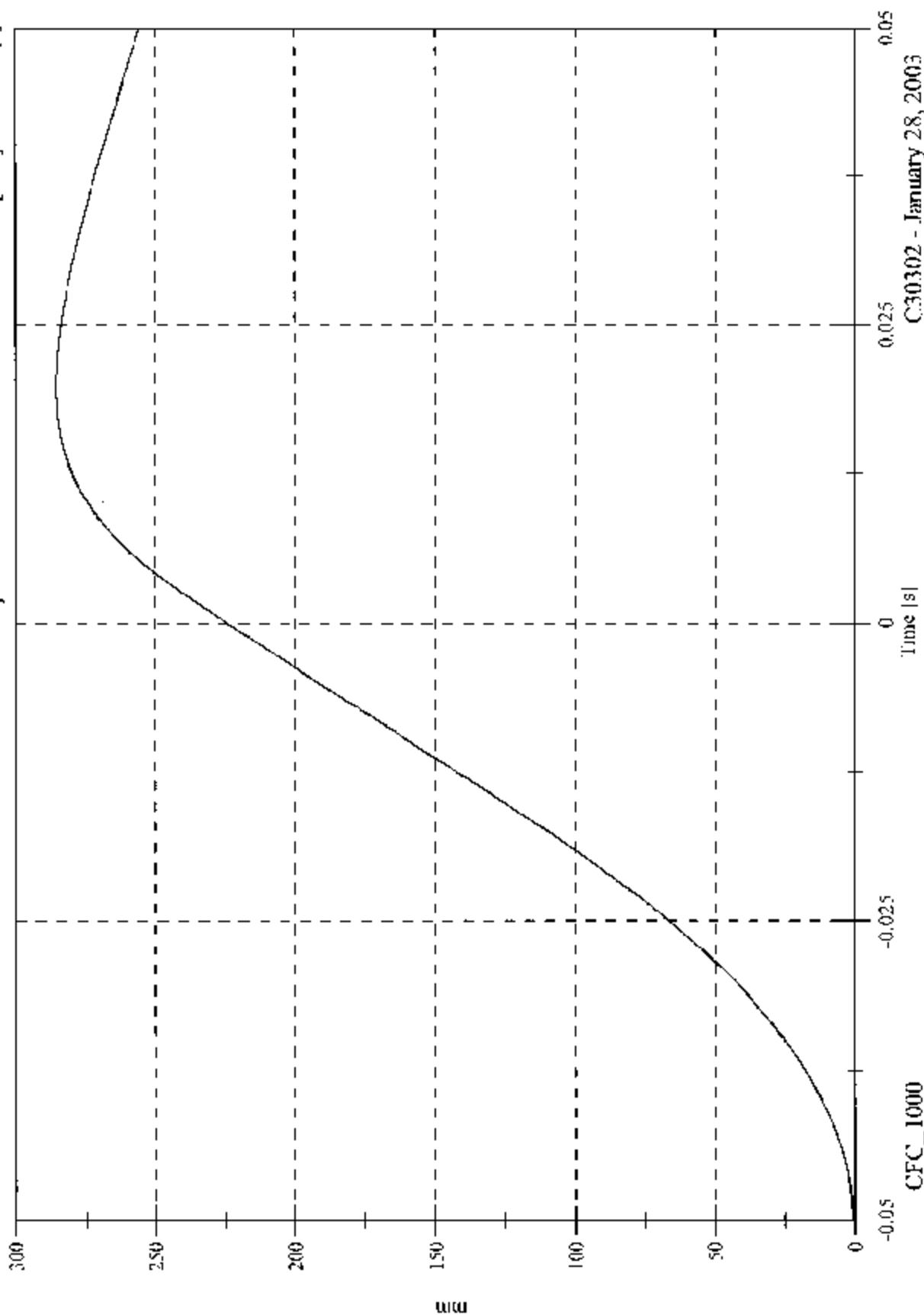
FMVSS 201U IMPACT TEST - 2003 JEEP LIBERTY



FMVSS 201U IMPACT TEST - 2003 JEEP LIBERTY

Headform Displacement

Max: 285.5 [mm] at 0.020 [s]
Min: 0.7 [mm] at -0.050 [s]



C30302 - January 28, 2003

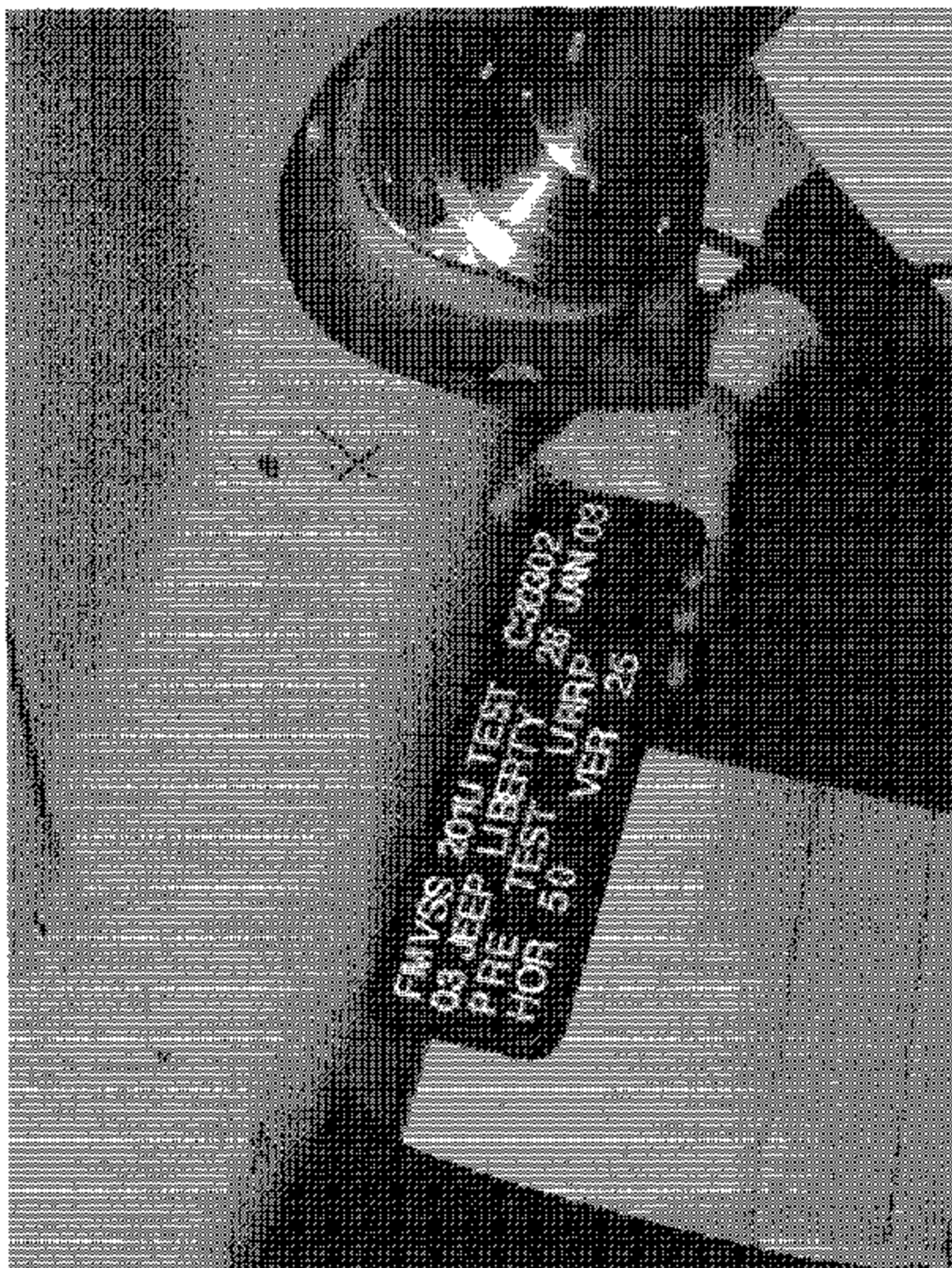
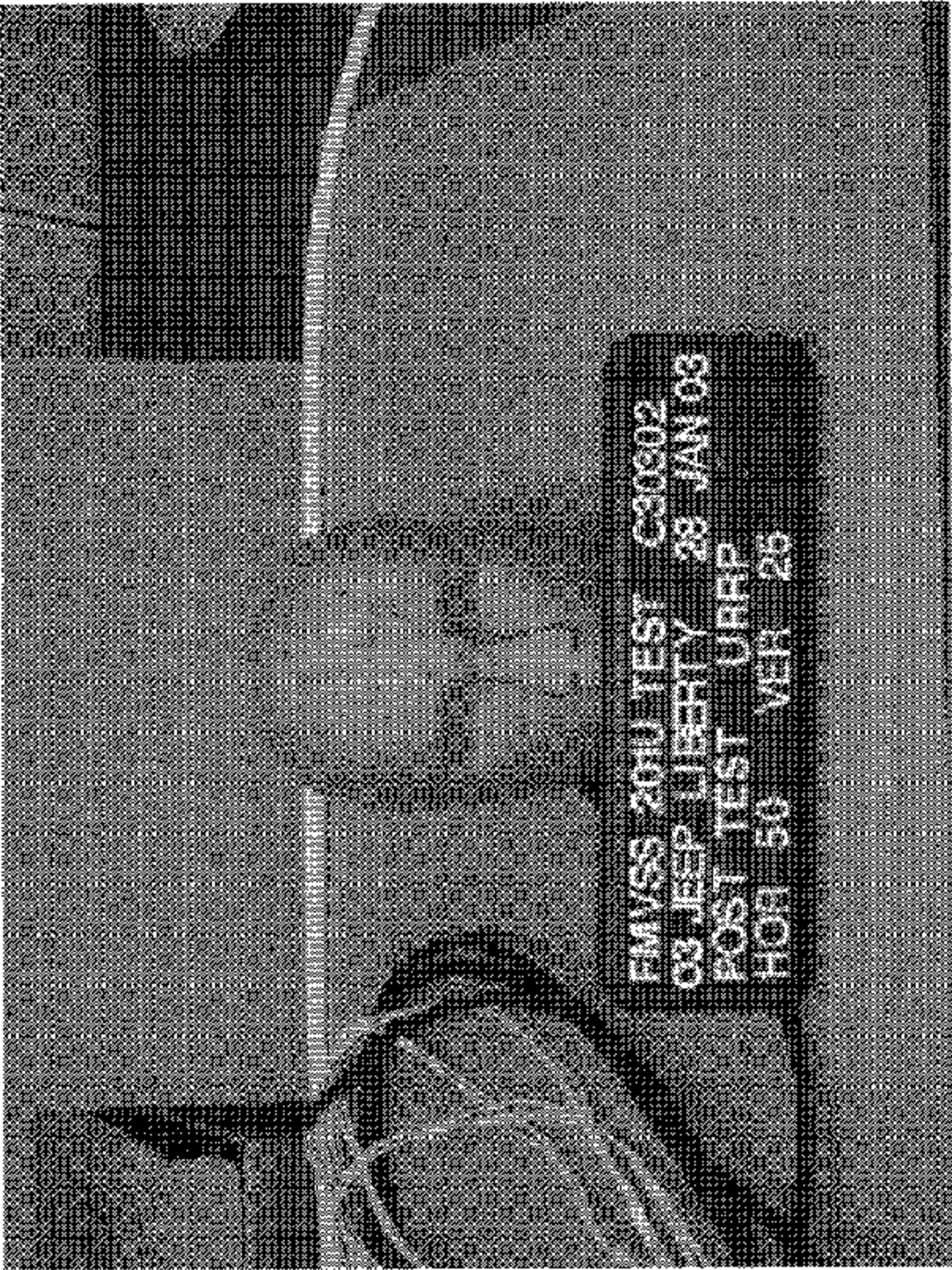


Figure PRE-TEST URRP



Figure : POSTEST URRP



FMVSS 2010 TEST C30002
03 JEEP LIBERTY 28 JAN 03
POST TEST URRP
HOB 50 VEH 26

Figure : URRP HEADFORM

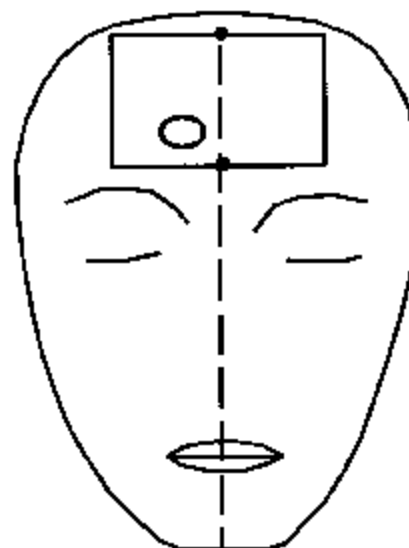
Year/Make/Model/Body Style: 2003 Jeep Liberty 4-door
 Vehicle Body Color: Red VIN: 1J4GL48183W539150
 Vehicle NHTSA No.: C30302 Month & Year of Manufacture: 9/2002

Test Number: 7 Test Date: 1/29/03
 Target Location: OTHER PILLAR Target Code: OP1
 Horizontal Impact Angle: 270 ° Vertical Impact Angle: 0 °
 Ambient Temperature: 21 °C Time of Impact: 11:15
 Headform Number: 0355

Impact Point:

Description:

Description: From lower midpoint					
On centerline	16	mm up			
On centerline	8	x	mm right	-	mm left



Free Motion HIC: 563.8 HIC(d): 591.8
 Impact Velocity (kph): 23.39 HIC(t) 1.6 msec HIC(t)2 10.4 msec

Post-Test Comments:

FMVSS 201U IMPACT TEST - 2003 JEEP LIBERTY C30302 - OP1

FMII Headform 0355

Location: OP1

Test Date: January 29, 2003

Work File: OP1

-----TEST RESULTS-----

Lab Temperature: 21 C

HICd: 591.8

Lab Humidity: 13 %

HIC (36ms): 563.8

Velocity at Impact: 23.39 KPH

t1: 1.6 msec

t2: 10.4 msec

Free Flight Distance: 213.85 mm

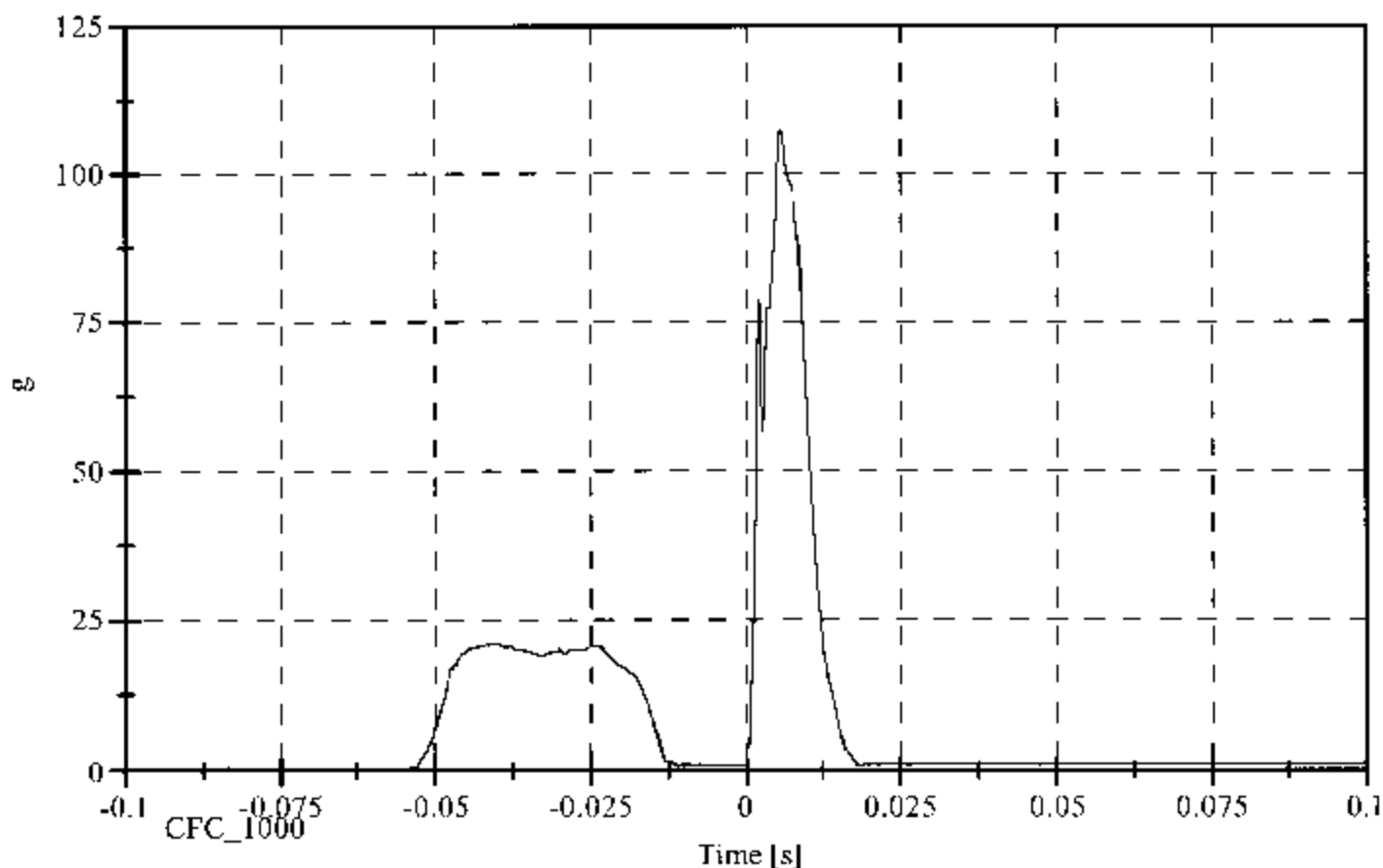
Duration: 8.8 msec

Average Acceleration: 8.4 g

FMVSS 201U IMPACT TEST - 2003 JEEP LIBERTY
Headform Resultant

Max: 107.3 [g] at 0.005 [s]

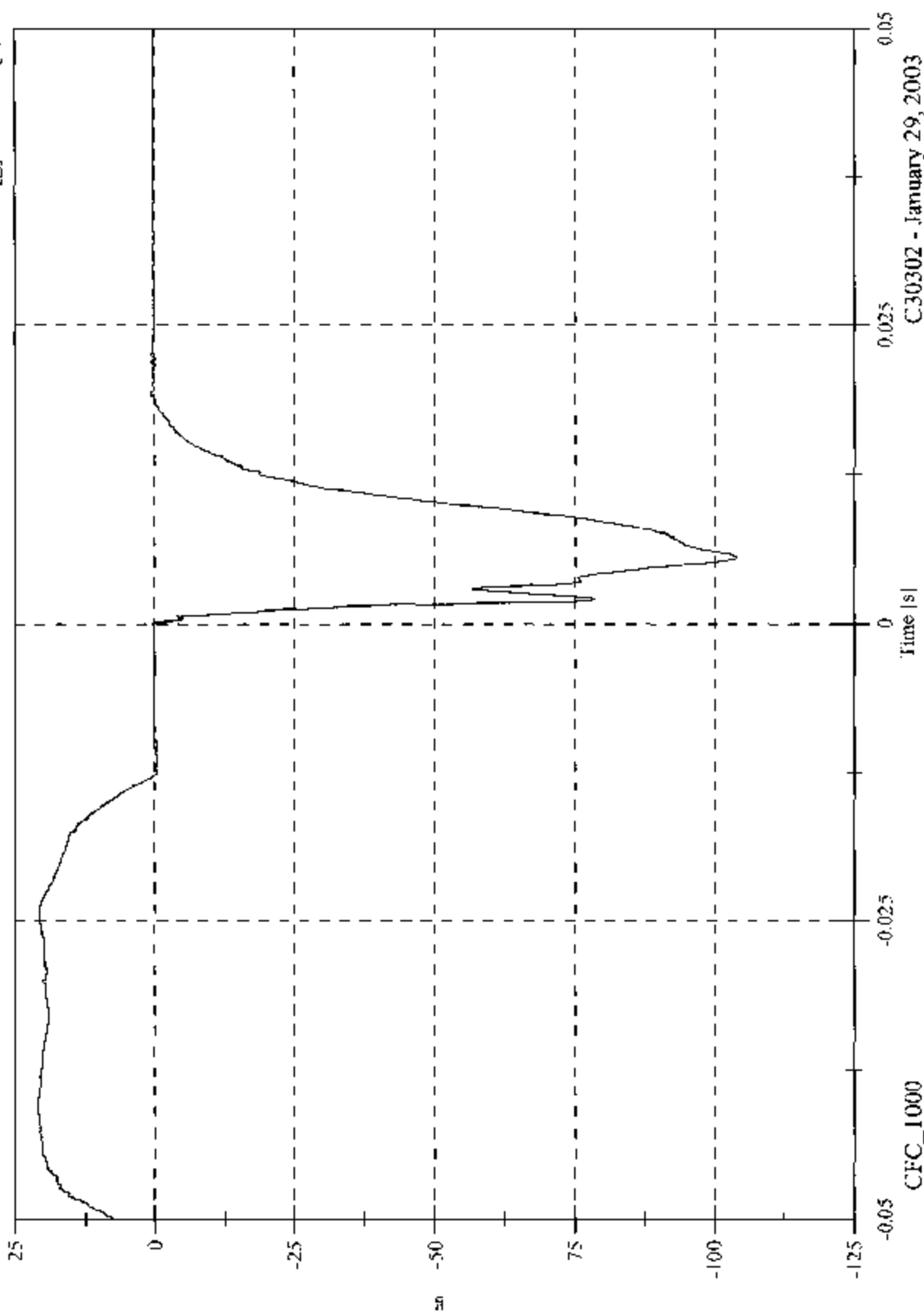
Min: 0.0 [g] at -0.091 [s]



FMVSS 201U IMPACT TEST - 2003 JEEP LIBERTY

Headform X Acceleration

Max: 21.0 [g] at -0.041 [s]
Min: -103.8 [g] at 0.005 [s]



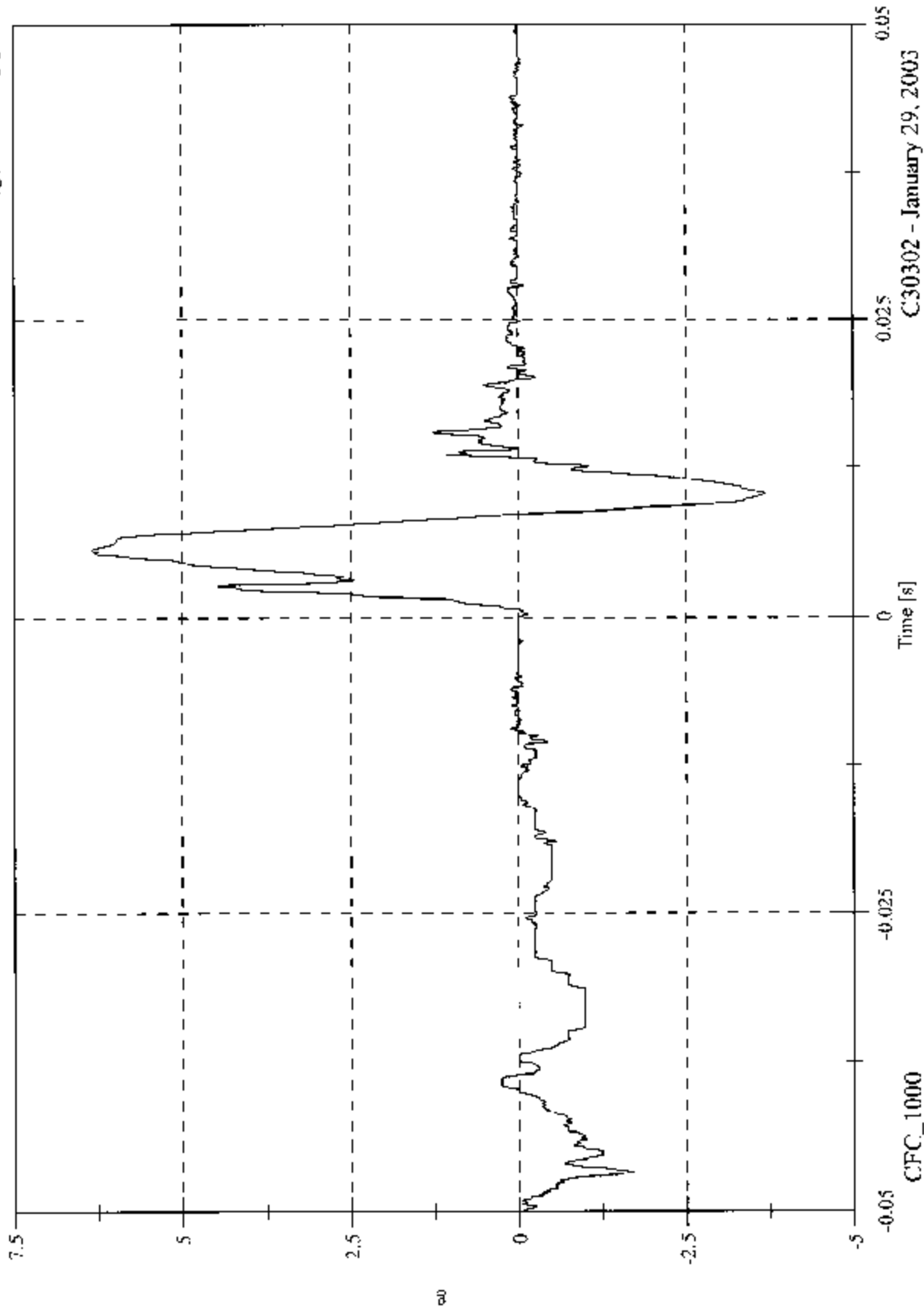
C30302 - January 29, 2003

FMVSS 201U IMPACT TEST - 2003 JEEP LIBERTY

Headform Y Acceleration

Max: 6.4 [g] at 0.006 [s]

Min: -3.7 [g] at 0.010 [s]



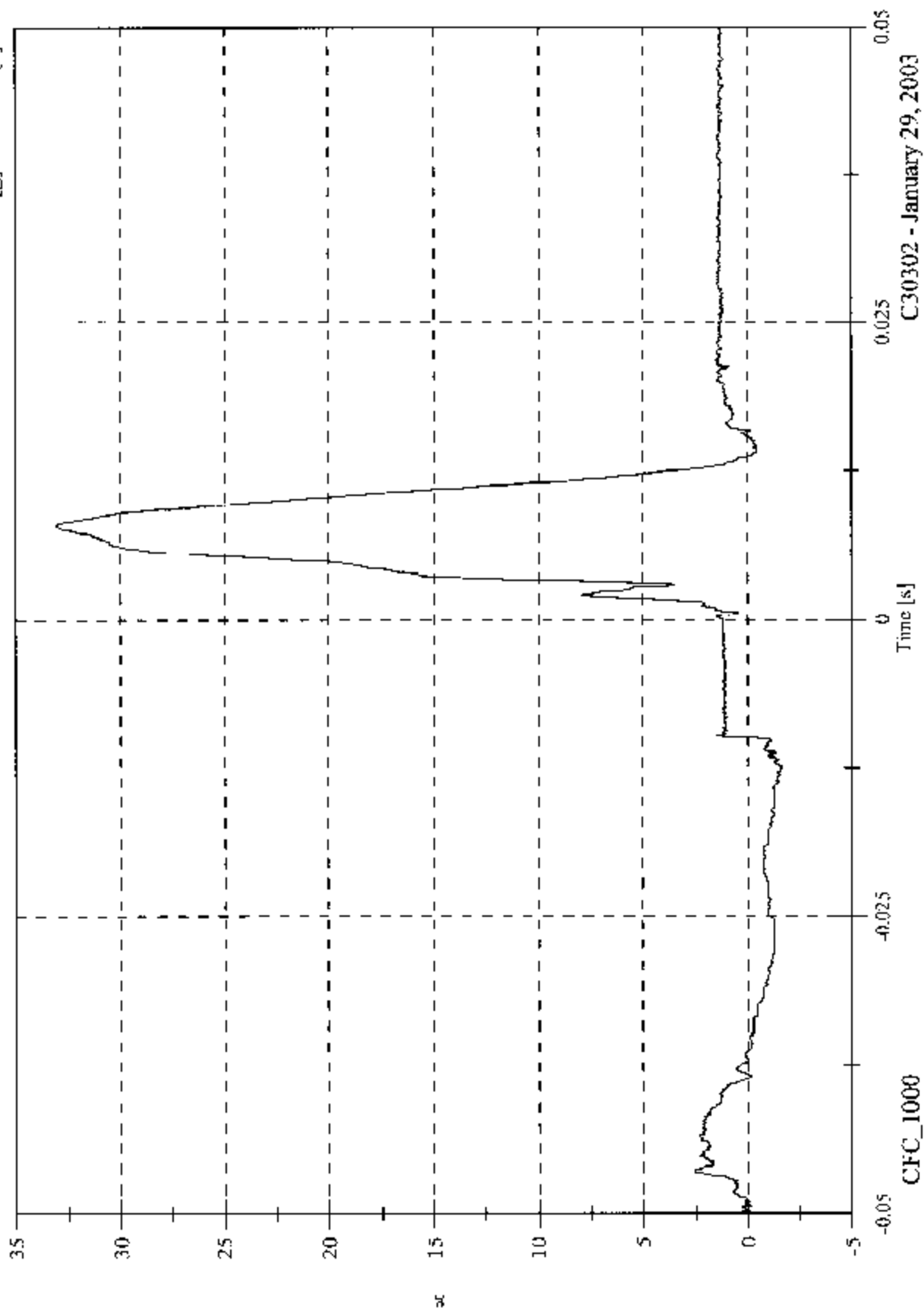
C30302 - January 29, 2003

FMVSS 201U IMPACT TEST - 2003 JEEP LIBERTY

Headform Z Acceleration

Max: 33.1 [g] at 0.008 [s]

Min: -1.7 [g] at -0.012 [s]

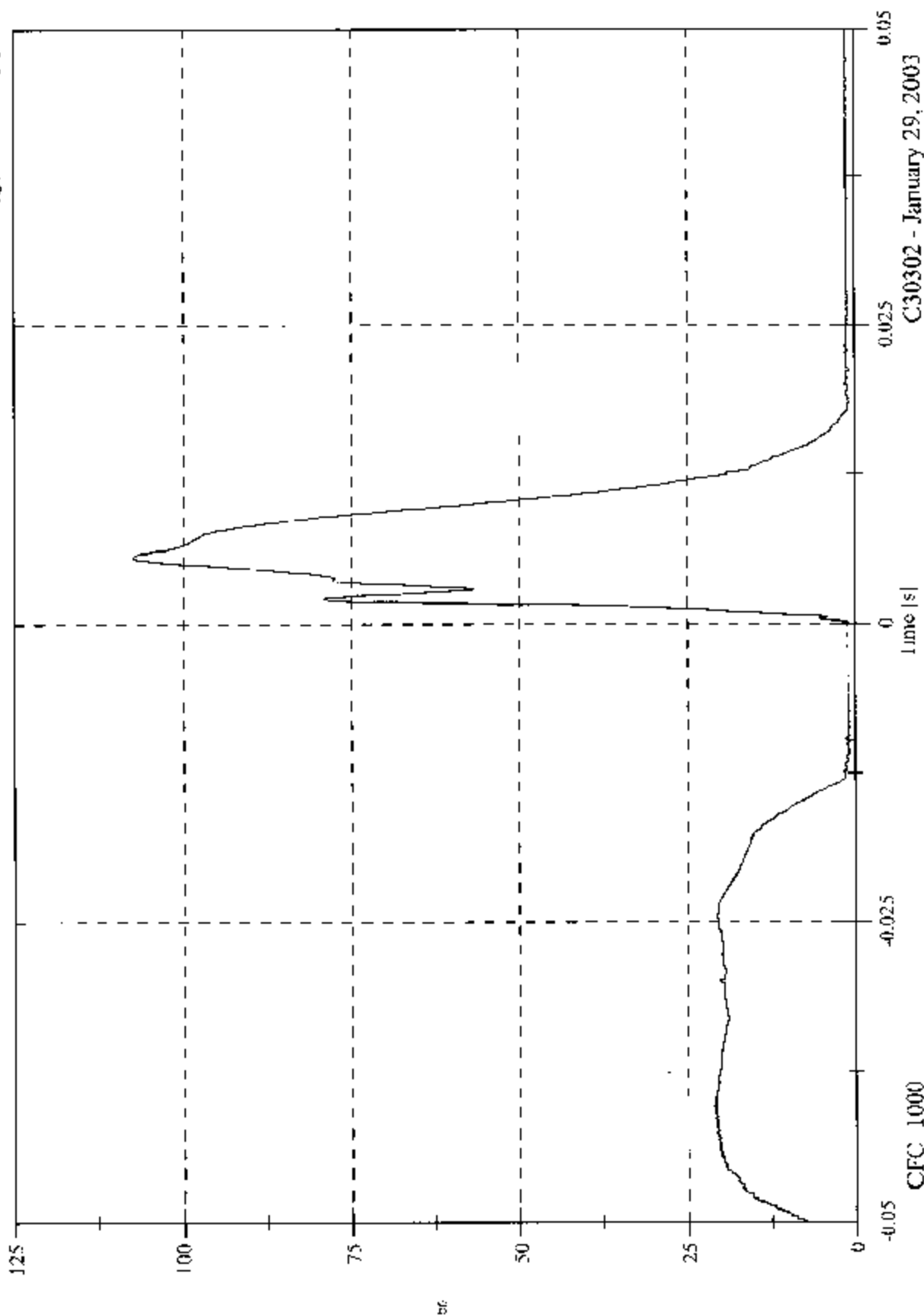


C30302 - January 29, 2003

FMVSS 201U IMPACT TEST - 2003 JEEP LIBERTY

Headform Resultant

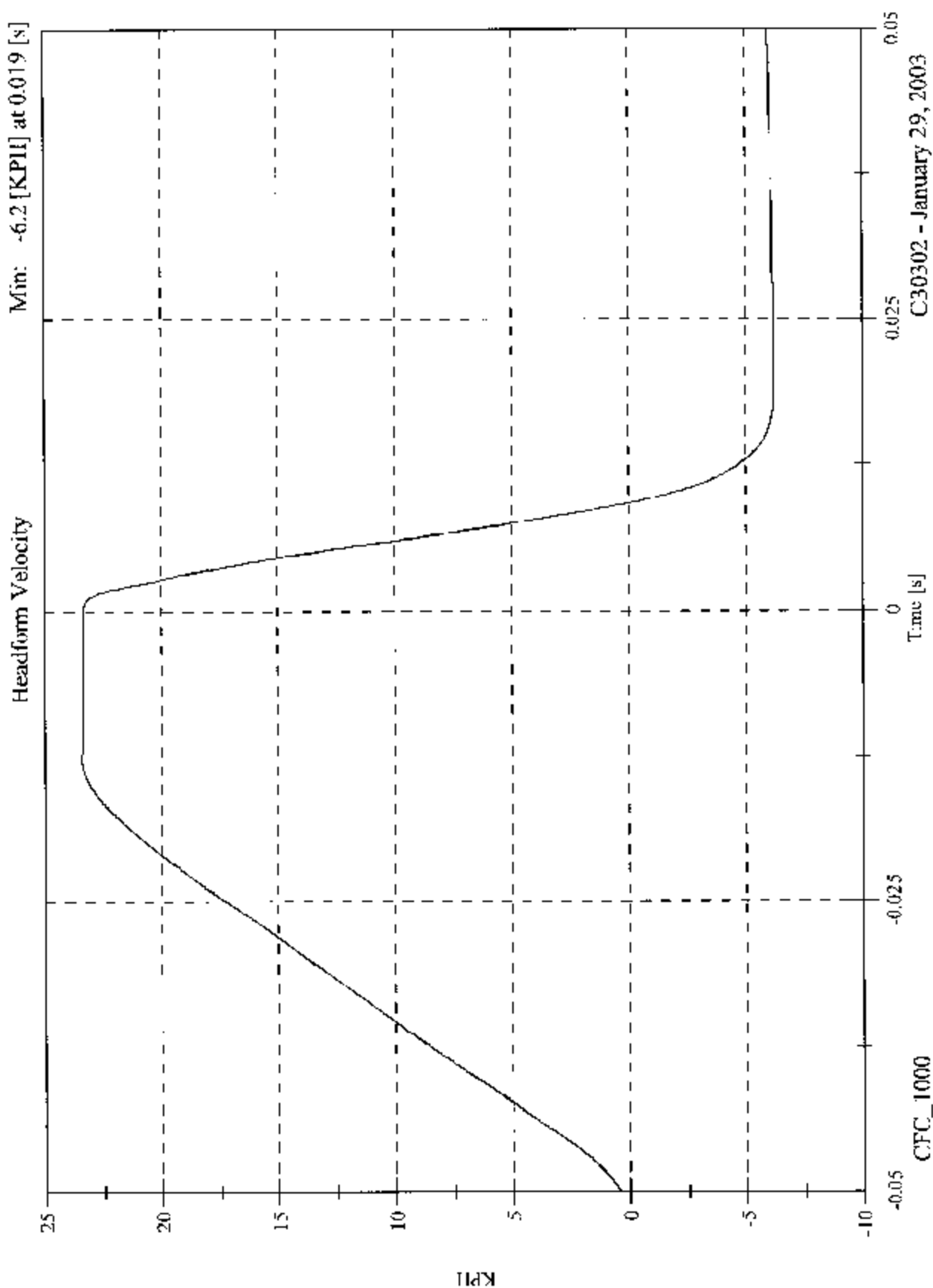
Max: 107.3 [g] at 0.005 [s]
Min: 0.4 [g] at -0.010 [s]



C30302 - January 29, 2003

FMVSS 201U IMPACT TEST - 2003 JEEP LIBERTY

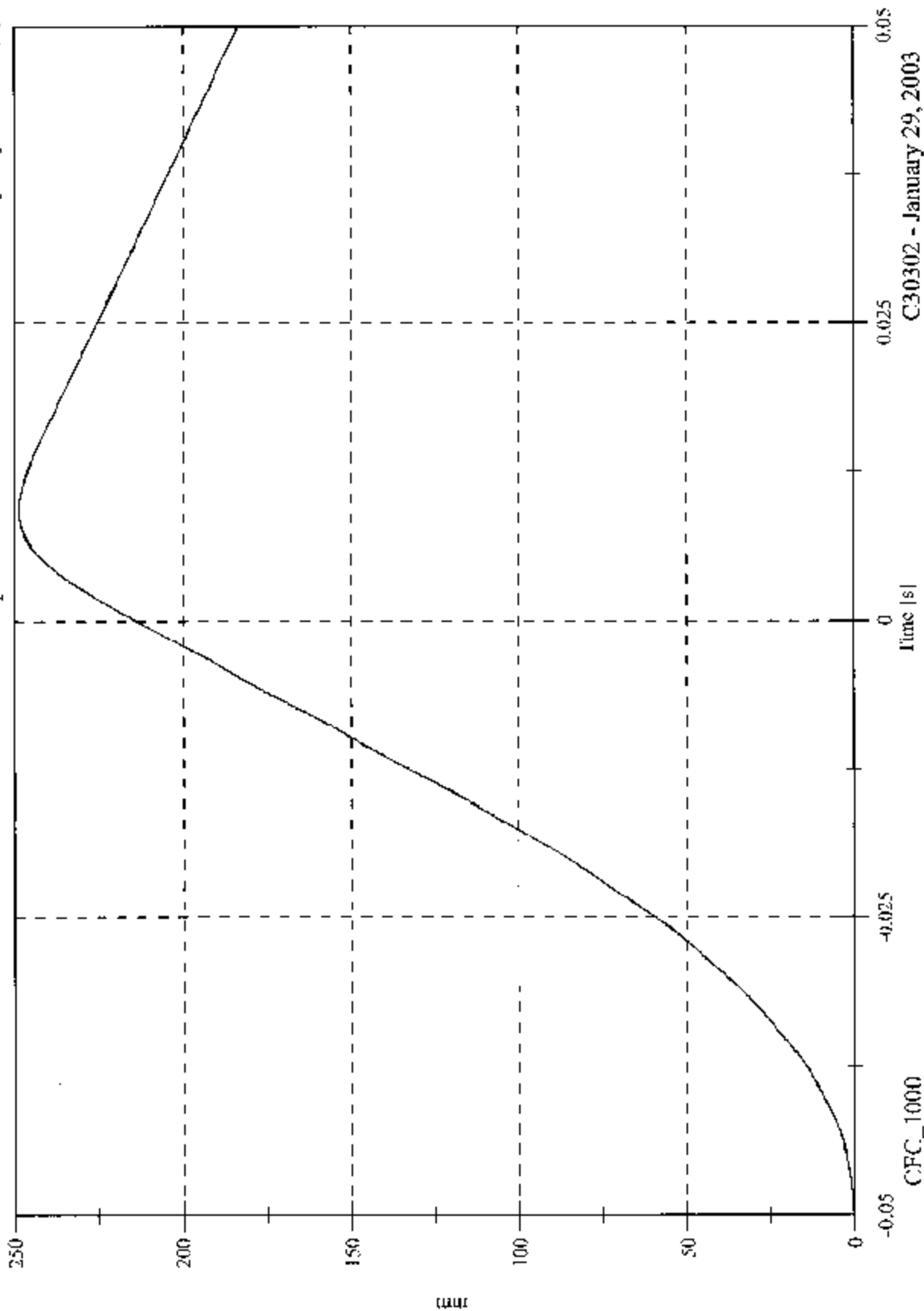
Max: 23.4 [KPII] at -0.013 [s]
 Min: -6.2 [KPII] at 0.019 [s]



FMVSS 201U IMPACT TEST - 2003 JEEP LIBERTY

Headform Displacement

Max: 248.9 [mm] at 0.009 [s]
Min: 0.3 [mm] at -0.050 [s]



C30302 - January 29, 2003

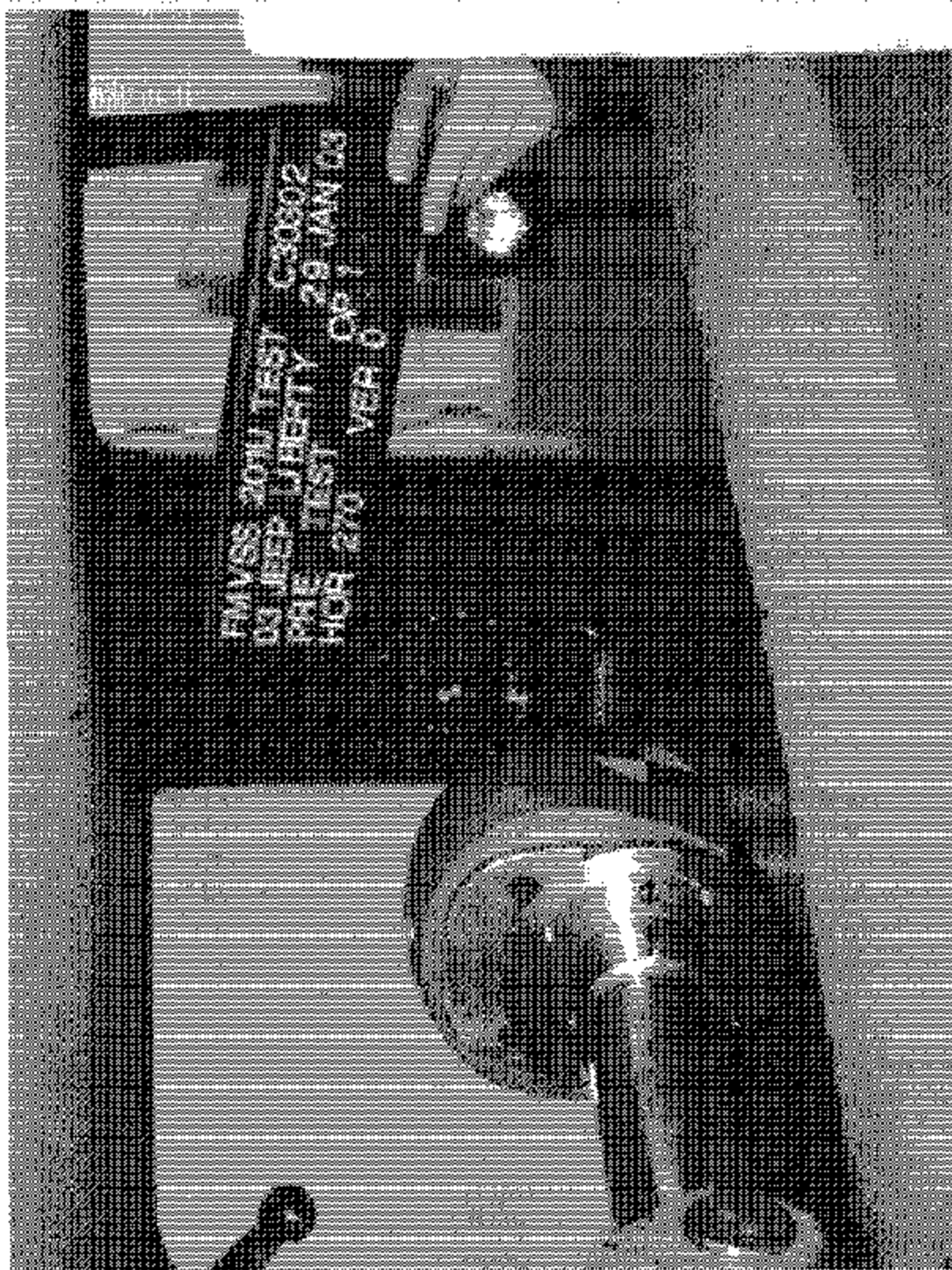


Figure 1. PRE-TEST CRT



Figure 1. POST-TEST (OP1)

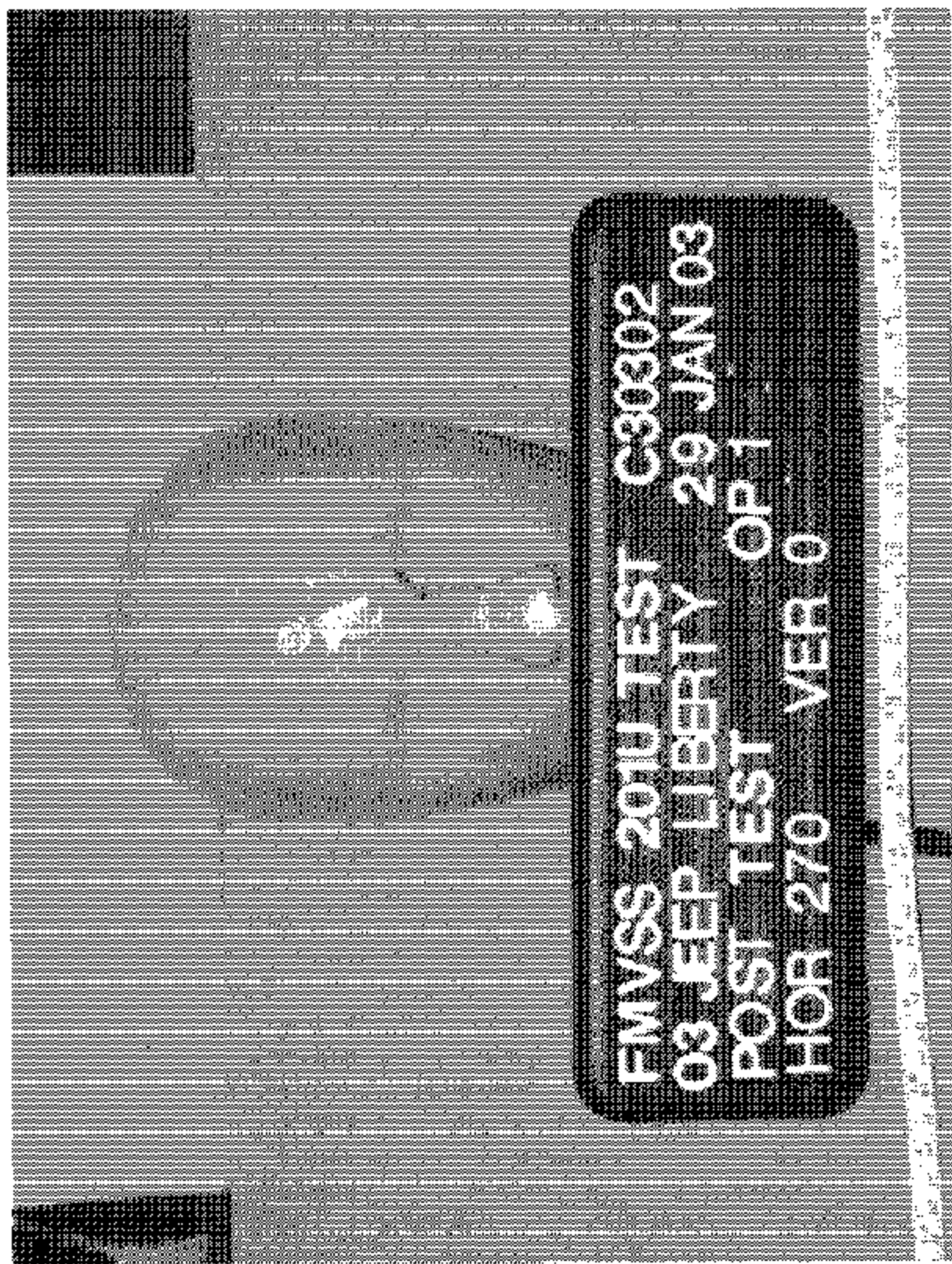


Figure 1: OPI HEADFORM

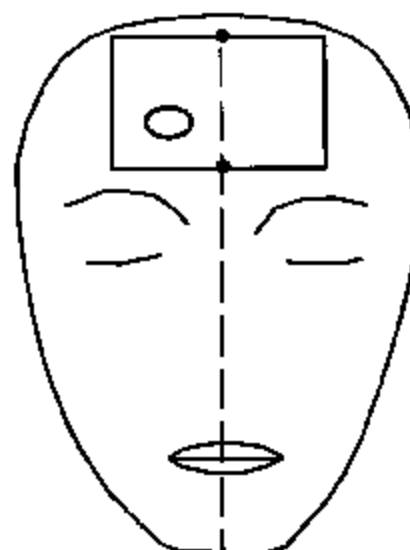
Year/Make/Model/Body Style: 2003 Jeep Liberty 4-door
 Vehicle Body Color: Red VIN: 1J4GL48183W539150
 Vehicle NHTSA No.: C30302 Month & Year of Manufacture: 9/2002

Test Number: 8 Test Date: 1/29/03
 Target Location: SIDE RAIL GRAB HANDLE Target Code: SR3B
 Horizontal Impact Angle: 270 ° Vertical Impact Angle: 50 °
 Ambient Temperature: 22 °C Time of Impact: 12:00
 Headform Number: 1255

Impact Point:

Description:

Description:	From lower midpoint				
On centerline	22	mm up			
On centerline	19	x	mm right	-	mm left



Free Motion HIC: 327.7 HIC(d): 413.6
 Impact Velocity (kph): 23.60 HIC(t) 1.4 msec HIC2 11.6 msec

Post-Test Comments:

FMVSS 201U IMPACT TEST - 2003 JEEP LIBERTY C30302 - SR3B

FMH Headform 1255

Location: SR3B

Test Date: January 29, 2003

Work File: SR3B

-----TEST RESULTS-----

Lab Temperature: 22 C

HICd: 413.6

Lab Humidity: 14 %

HHC (36ms): 327.7

Velocity at Impact: 23.60 KPH

t1: 1.4 msec

t2: 11.6 msec

Free Flight Distance: 216.99 mm

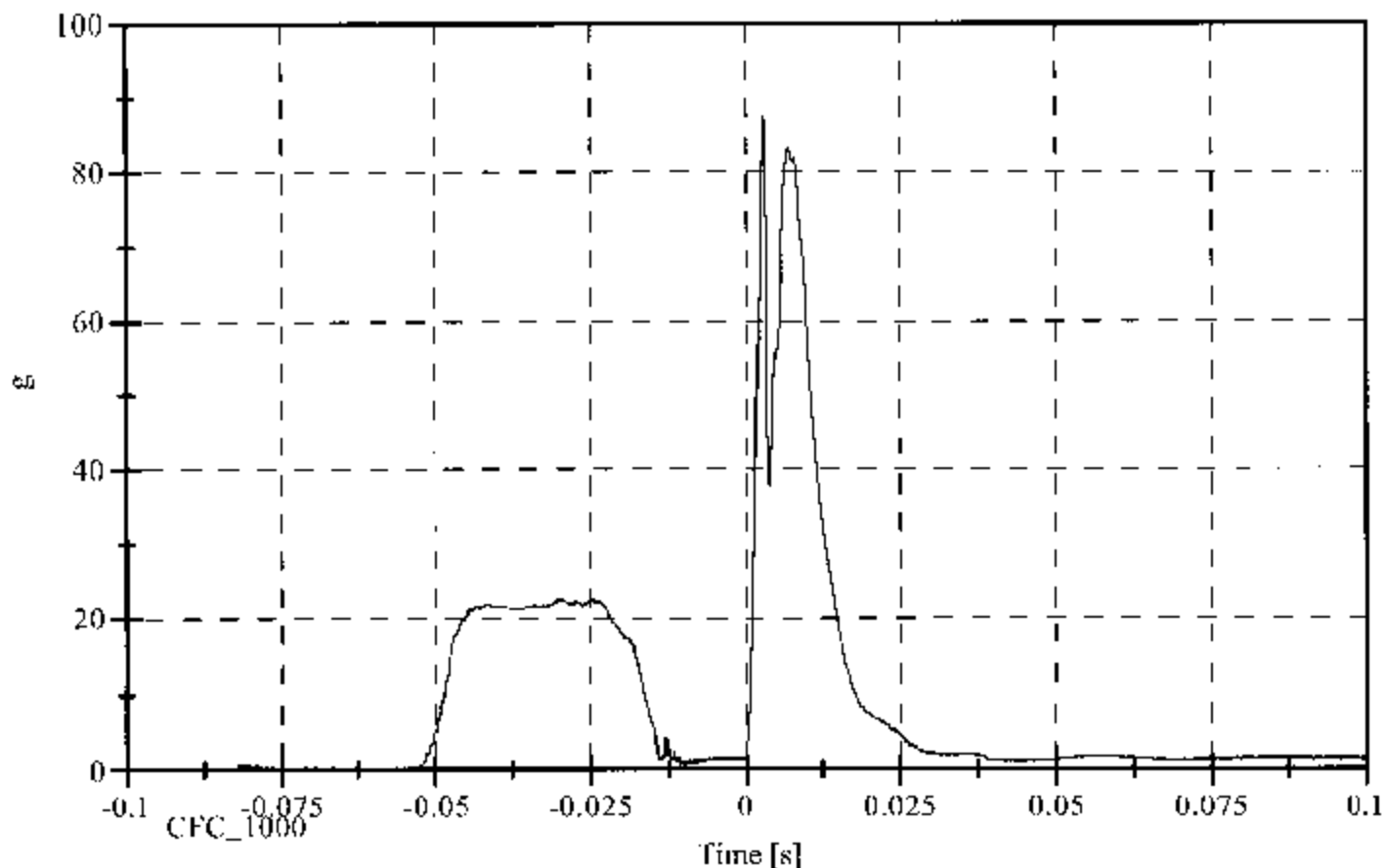
Duration: 10.2 msec

Average Acceleration: 8.4 g

FMVSS 201U IMPACT TEST - 2003 JEEP LIBERTY
Headform Resultant

Max: 87.6 [g] at 0.003 [s]

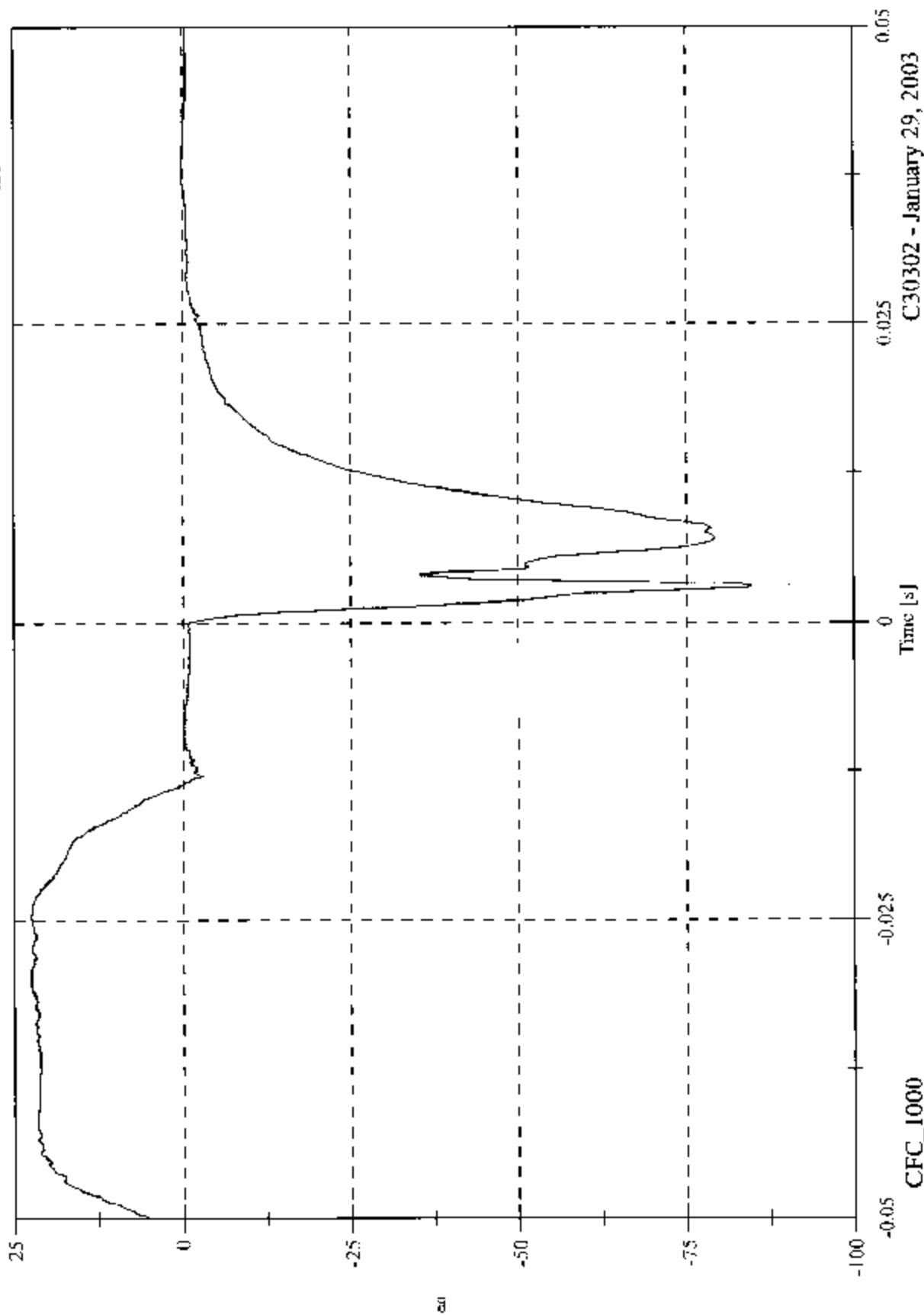
Min: 0.0 [g] at -0.062 [s]



FMVSS 201U IMPACT TEST - 2003 JEEP LIBERTY

Headform X Acceleration

Max: 22.5 [g] at -0.029 [s]
Min: -84.7 [g] at 0.003 [s]

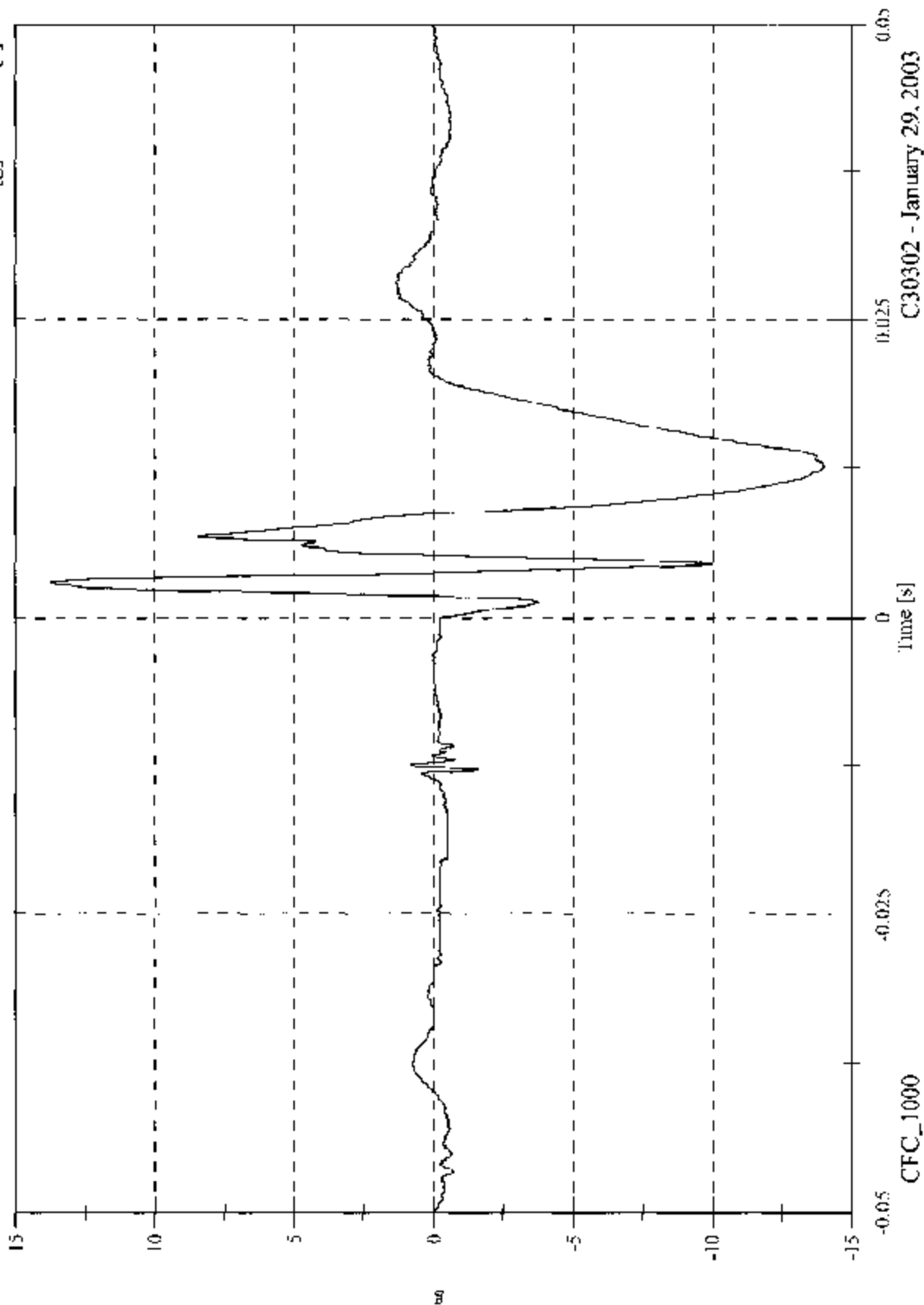


C30302 - January 29, 2003

FMVSS 201U IMPACT TEST - 2003 JEEP LIBERTY

Max: 13.7 [g] at 0.003 [s]
Min: -14.0 [g] at 0.013 [s]

Headform Y Acceleration



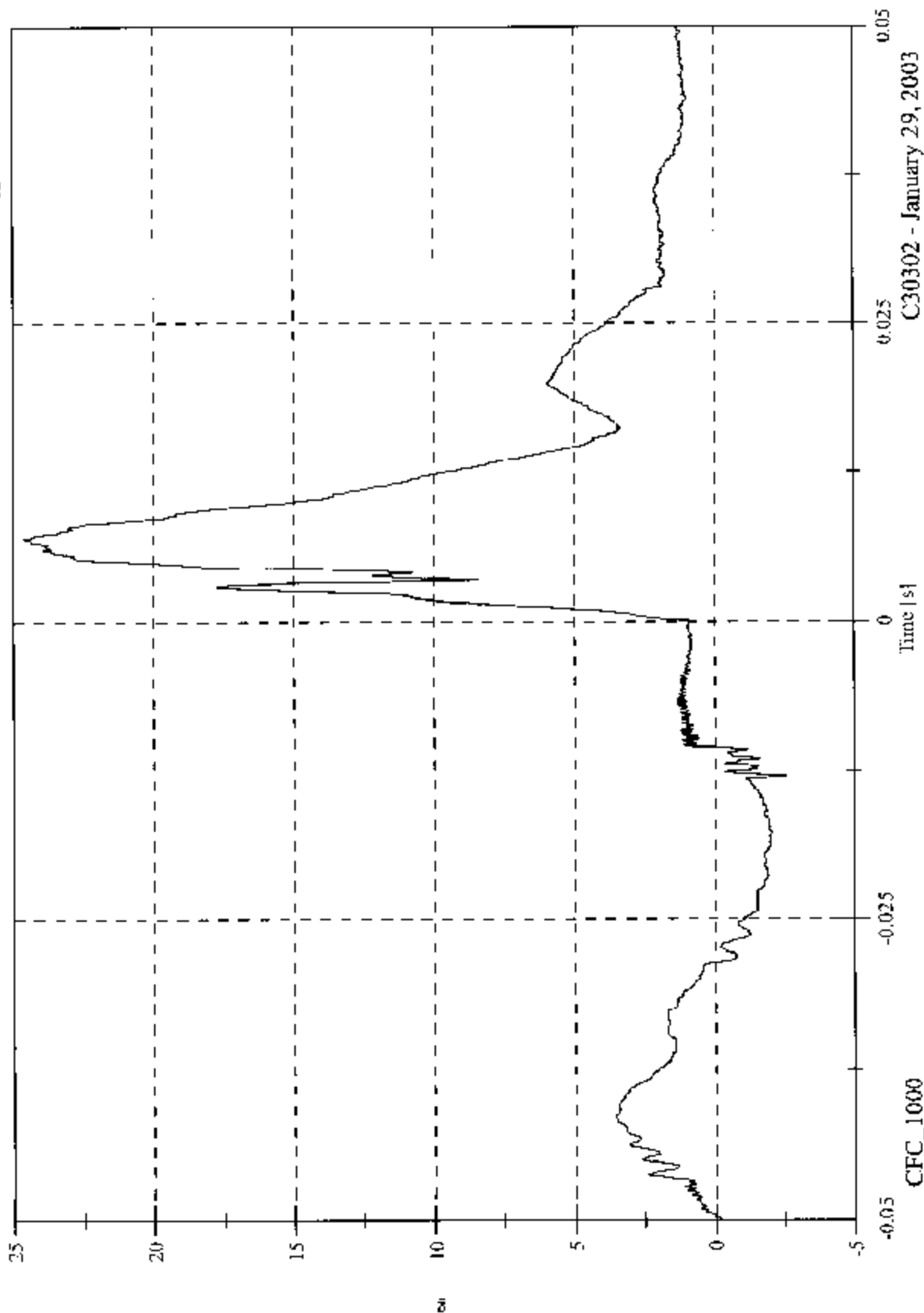
C30302 - January 29, 2003

FMVSS 2010 IMPACT TEST - 2003 JEEP LIBERTY

Leadform Z Acceleration

Max: 24.7 [g] at 0.007 [s]

Min: -2.6 [g] at -0.013 [s]

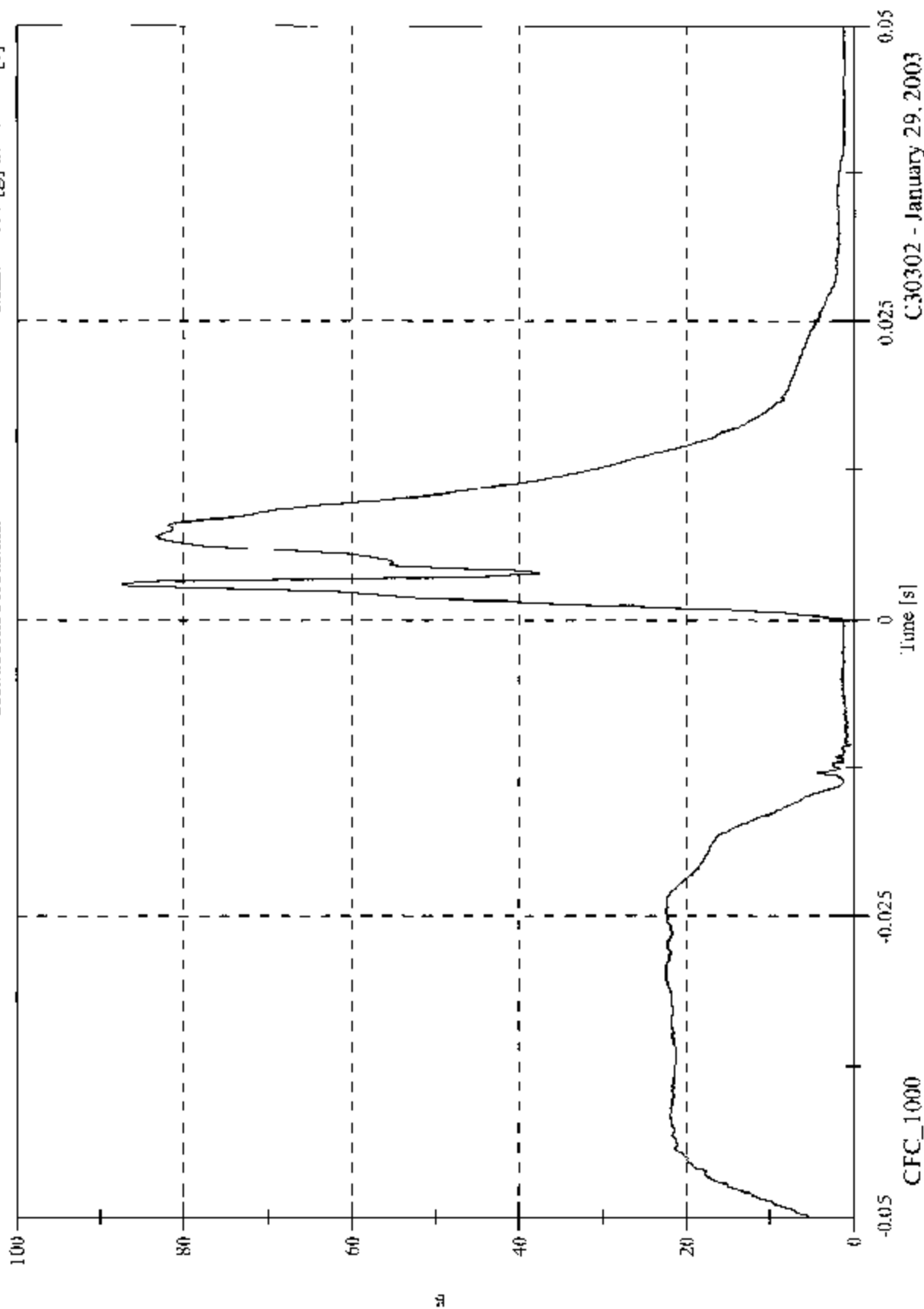


C30302 - January 29, 2003

FMVSS 201U IMPACT TEST - 2003 JEEP LIBERTY

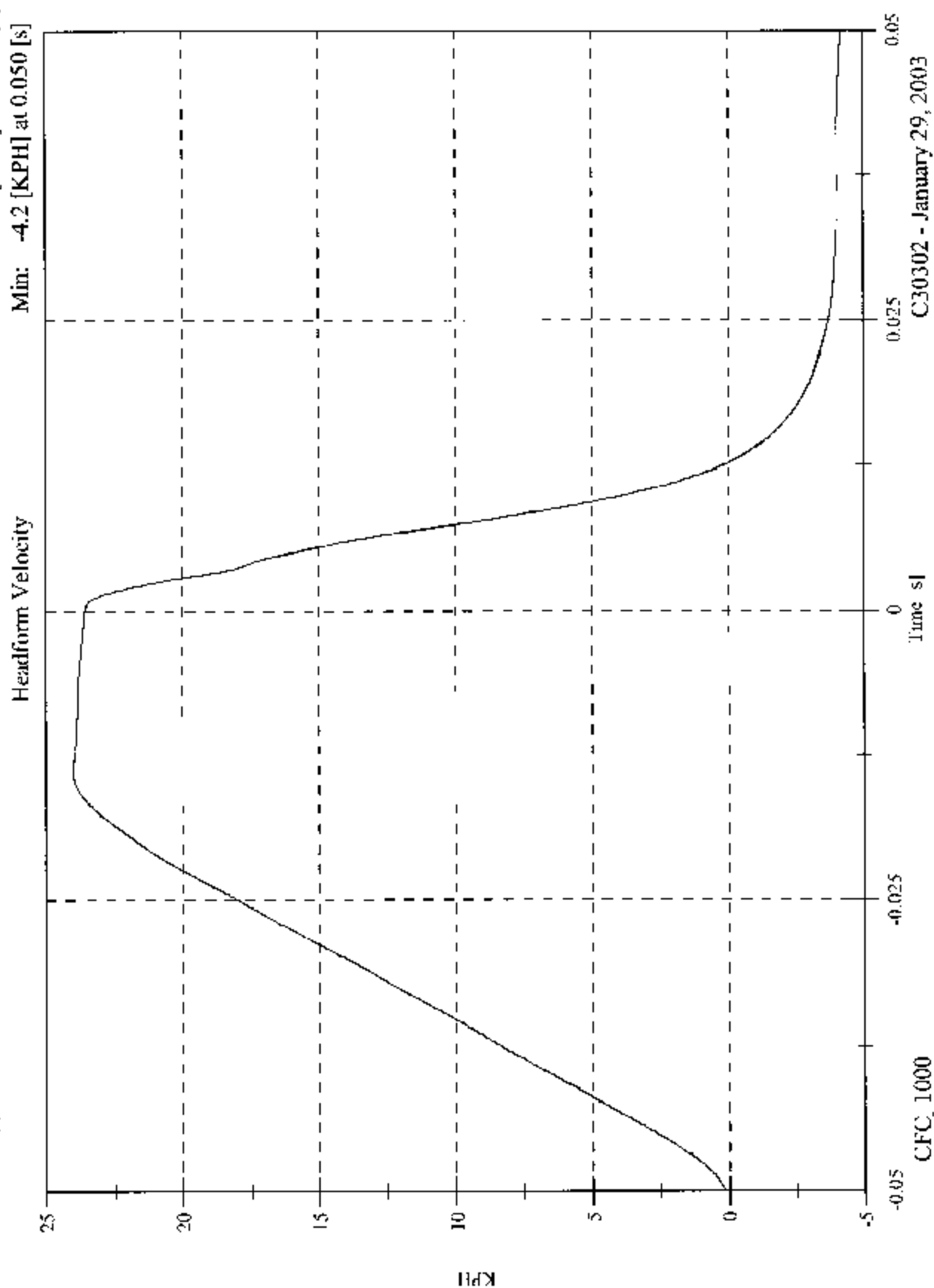
Headform Resultant

Max: 87.6 [g] at 0.003 [s]
Min: 0.4 [g] at -0.011 [s]



FMVSS 201U IMPACT TEST - 2003 JEEP LIBERTY

Max: 24.0 [KPH] at -0.014 [s]
 Min: -4.2 [KPH] at 0.050 [s]

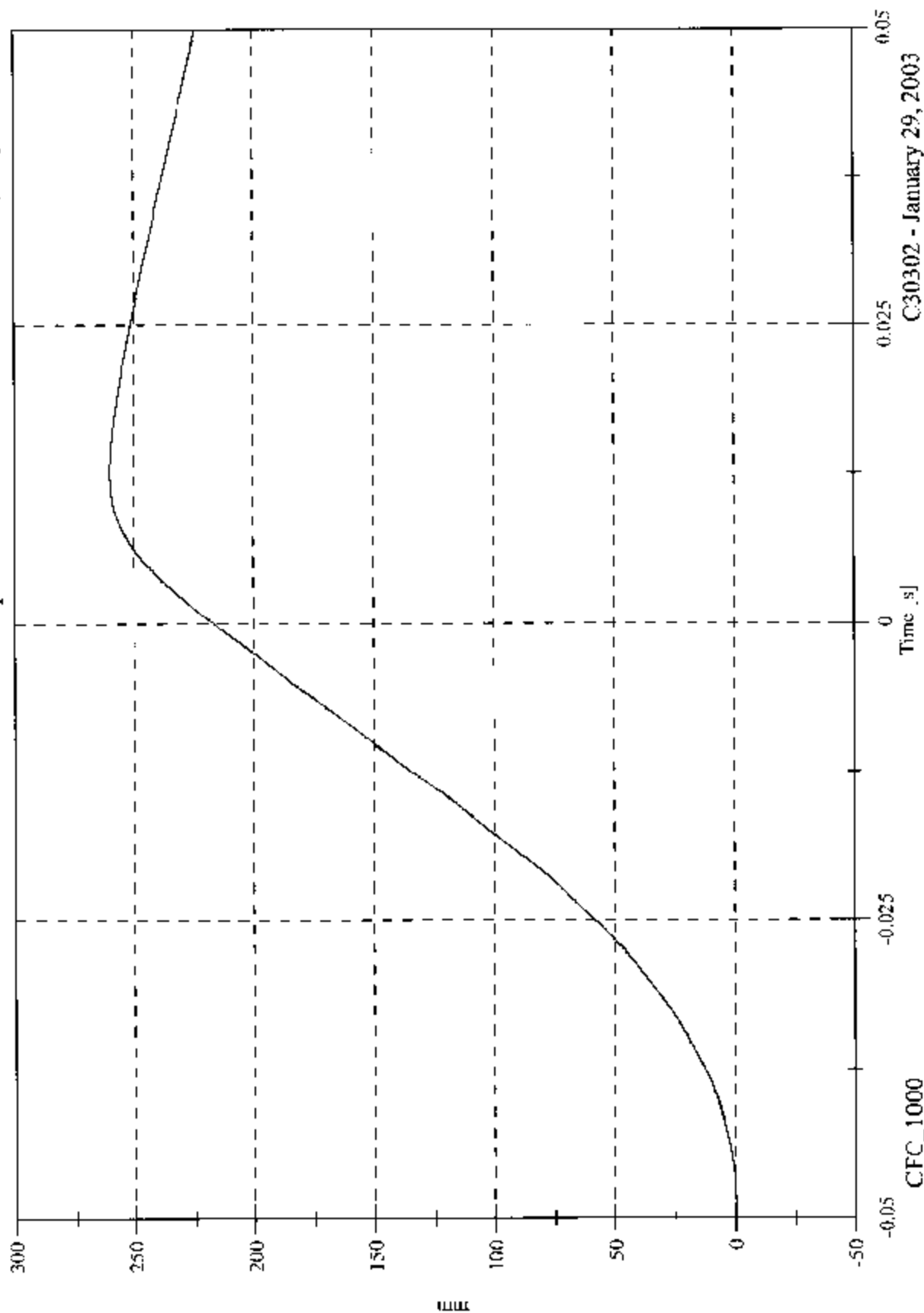


C30302 DRIVER SIDE SR3B IMPACT PLOT #5

FMVSS 201U IMPACT TEST - 2003 JEEP LIBERTY

Headform Displacement

Max: 260.2 [mm] at 0.013 [s]
Min: -0.3 [mm] at -0.050 [s]



C30302 - January 29, 2003

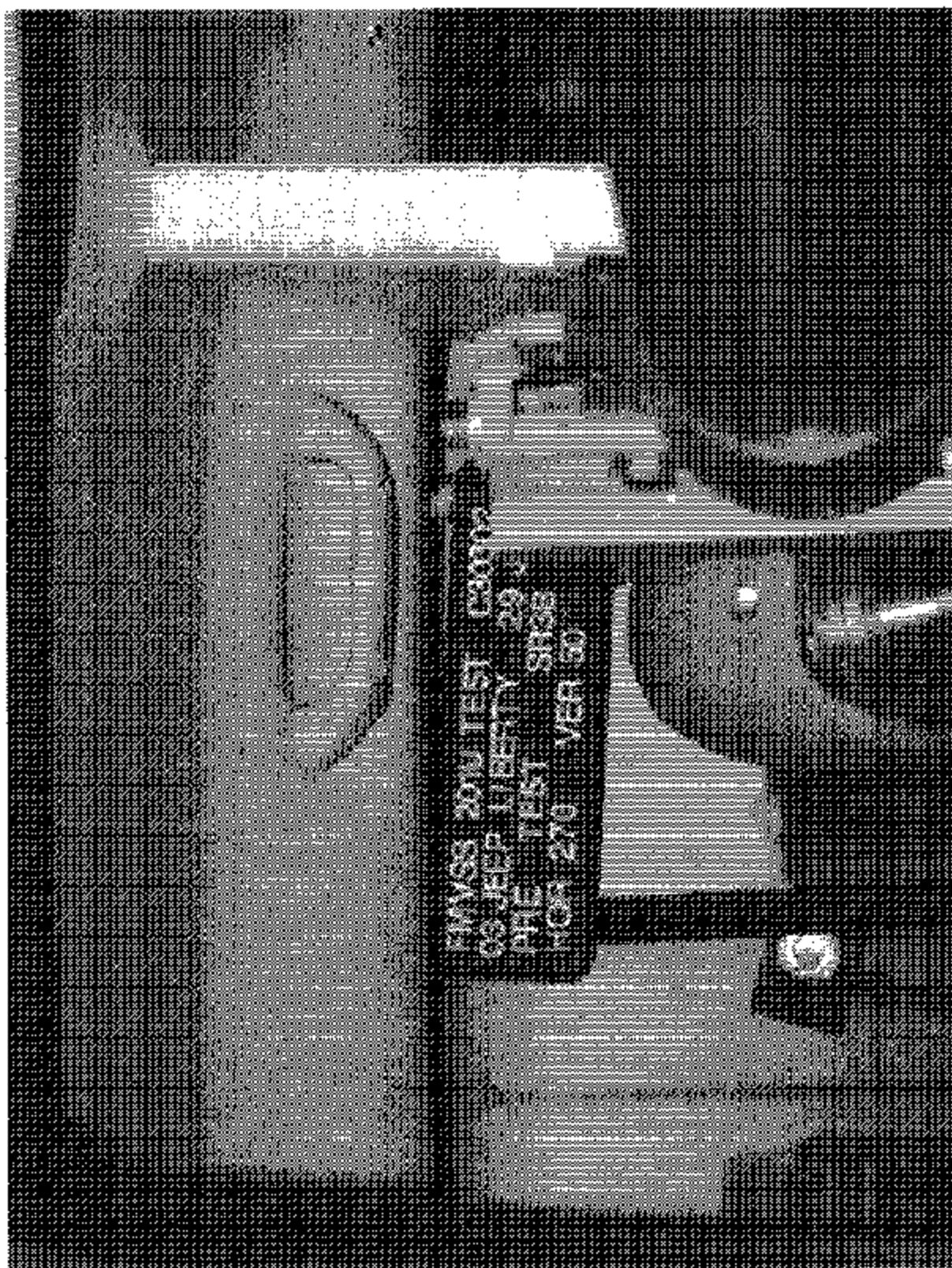


Figure 1: PIR-TPST SR3B

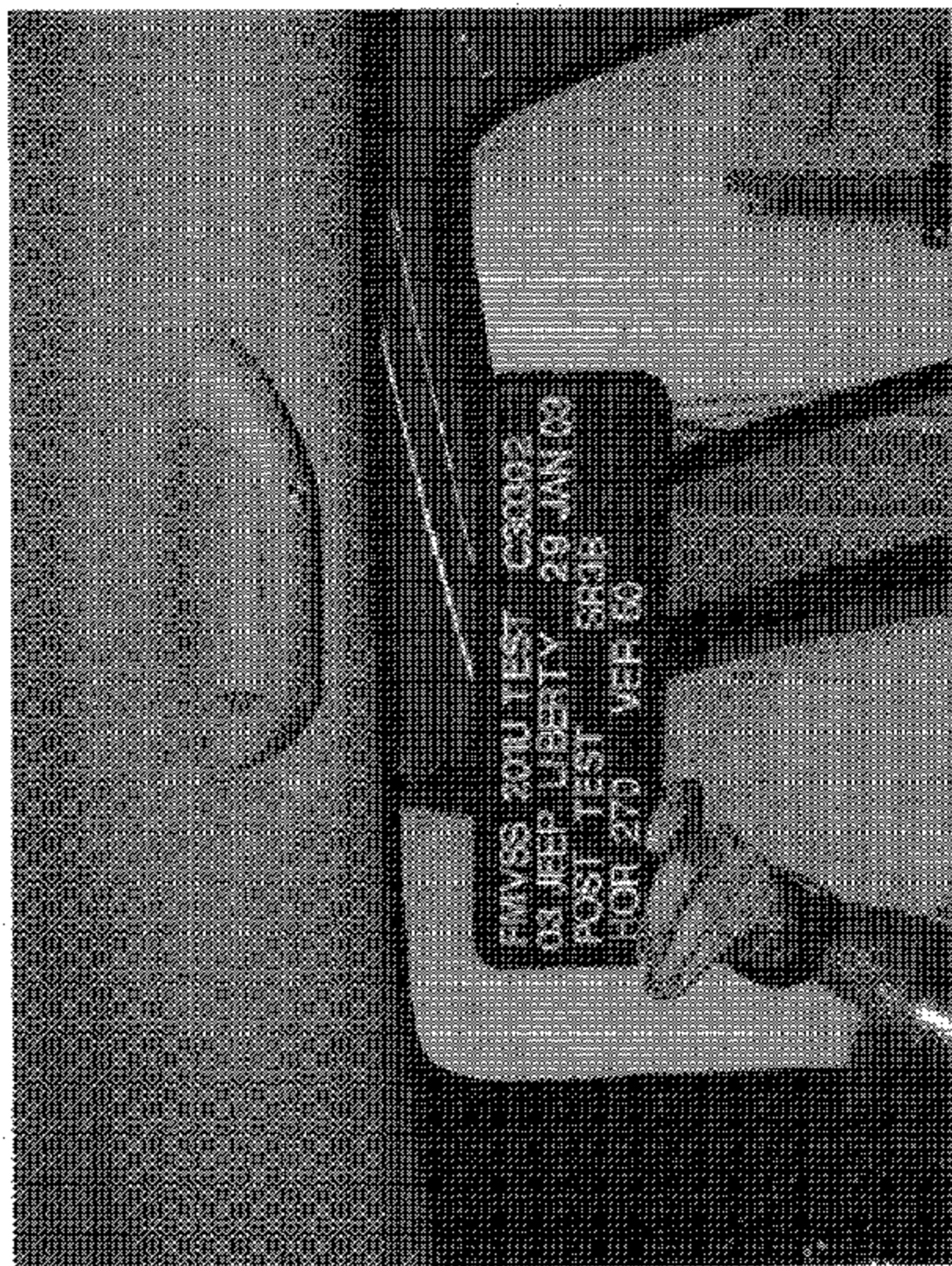


Figure - POST-TEST SR3B

FMVSS 2011 TEST C30302
03 JEEP LIBERTY 29 JAN 03
POST TEST SR3B
HOR 270 VEH 50

Figure . SR3B HEADFORM

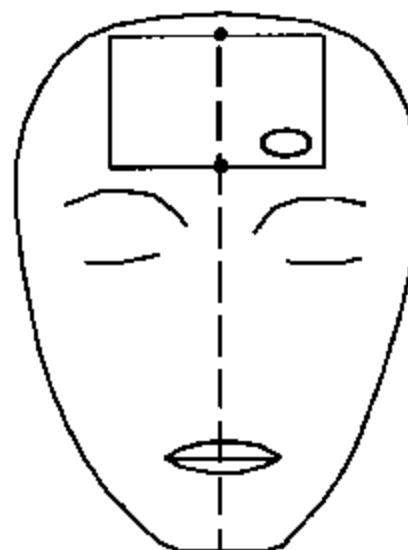
Year/Make/Model/Body Style: 2003 Jeep Liberty 4-door
 Vehicle Body Color: Red VIN: 1J4GL48183W539150
 Vehicle NHTSA No.: C30302 Month & Year of Manufacture: 9/2002

Test Number: 9 Test Date: 1/29/03
 Target Location: B-PILLAR Target Code: BP3
 Horizontal Impact Angle: 272 ° Vertical Impact Angle: -9 °
 Ambient Temperature: 22 °C Time of Impact: 14:35
 Headform Number: 0062

Impact Point:

Description:

Description:	From lower midpoint				
On centerline	10	mm up			
On centerline	25	-	mm right	x	mm left



Free Motion HIC: 579.8 HIC(d): 603.8
 Impact Velocity (kph): 23.63 HIC1: 2.4 msec HIC2: 10.5 msec

Post-Test Comments:

FMVSS 201U IMPACT TEST - 2003 JEEP LIBERTY C30302 - BP3

FMH Headform 0062

Location: BP3

Test Date: January 29, 2003

Work File: BP3

-----TEST RESULTS-----

Lab Temperature: 22 C

HICd: 603.8

Lab Humidity: 14 %

HIC (36ms): 579.8

Velocity at Impact: 23.63 KPH

t1: 2.4 msec

t2: 10.5 msec

Free Flight Distance: 212.34 mm

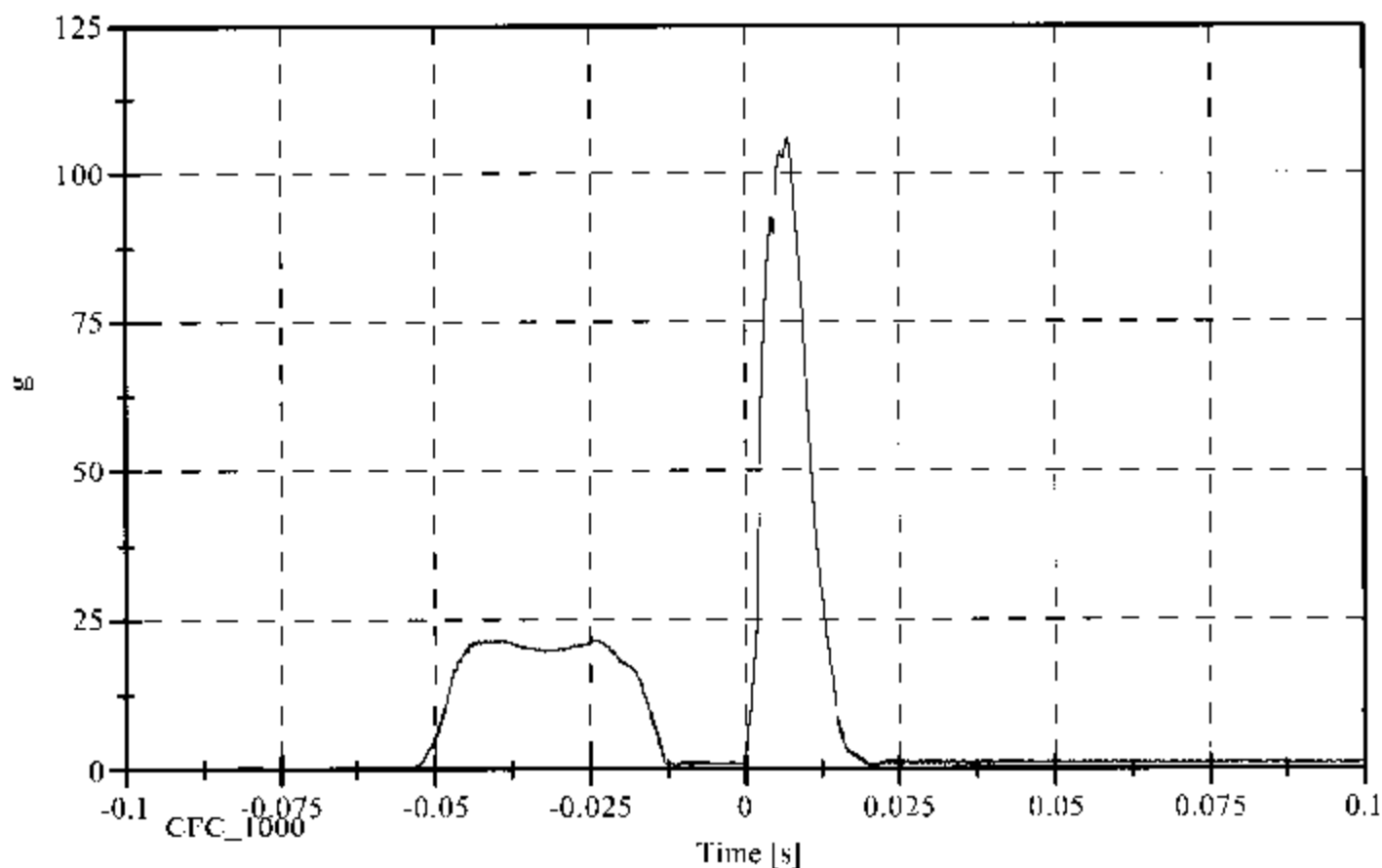
Duration: 8.1 msec

Average Acceleration: 8.4 g

FMVSS 201U IMPACT TEST - 2003 JEEP LIBERTY
Headform Resultant

Max: 106.1 [g] at 0.007 [s]

Min: 0.0 [g] at -0.067 [s]

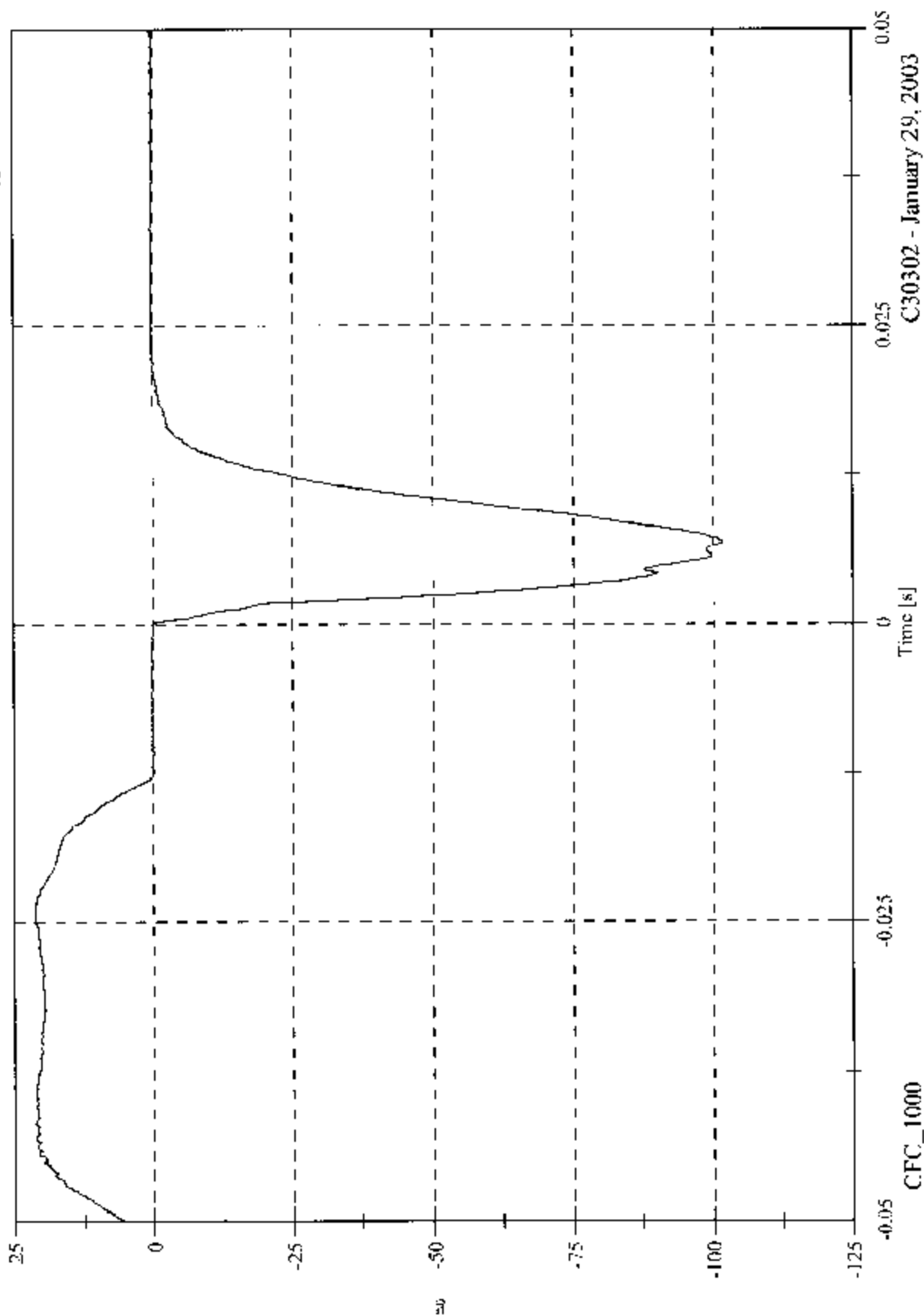


FMVSS 201U IMPACT TEST - 2003 JEEP LIBERTY

Headform X Acceleration

Max: 21.4 [g] at -0.042 [s]

Min: -101.7 [g] at 0.007 [s]

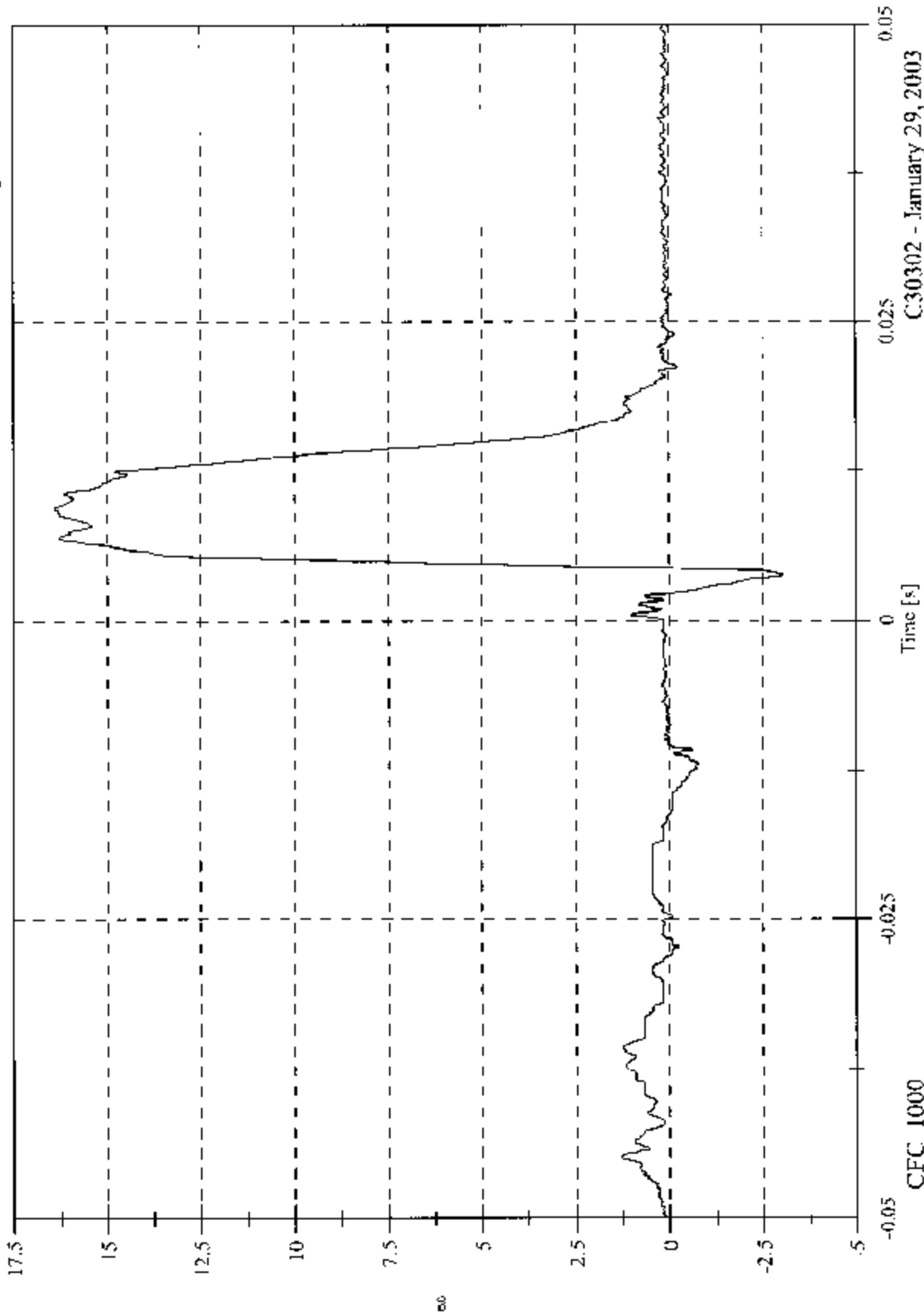


C30302 - January 29, 2003

FMVSS 2010 IMPACT TEST - 2003 JEEP LIBERTY

Headform Y Acceleration

Max: 16.4 [g] at 0.009 [s]
Min: -3.1 [g] at 0.004 [s]

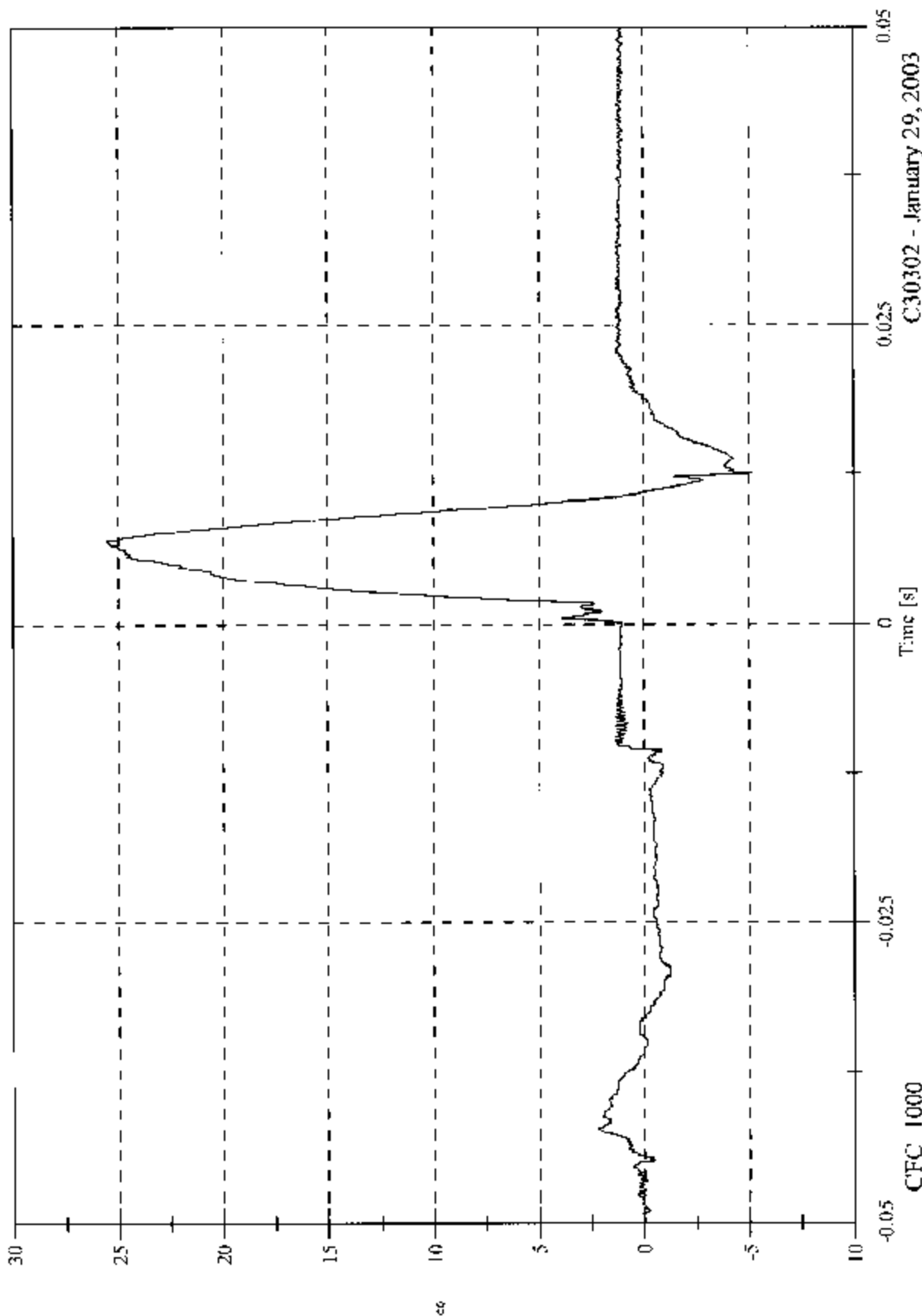


C30302 - January 29, 2003

FMVSS 201U IMPACT TEST - 2003 JEEP LIBERTY

Headform Z Acceleration

Max: 25.6 [g] at 0.007 [s]
Min: -5.1 [g] at 0.013 [s]



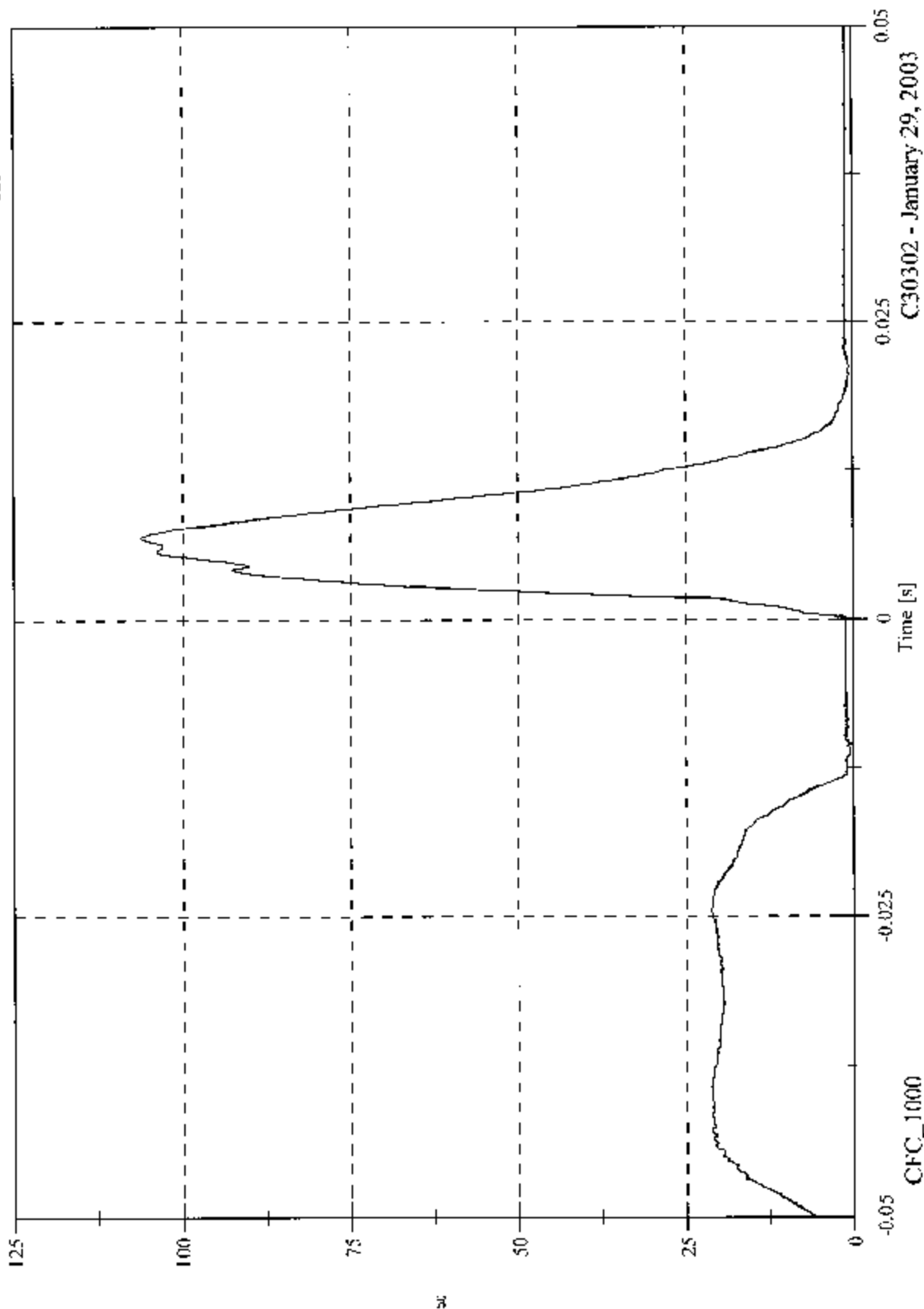
C30302 - January 29, 2003

FMVSS 201U IMPACT TEST - 2003 JEEP LIBERTY

Max: 106.1 [g] at 0.007 [s]

Min: 0.3 [g] at -0.011 [s]

Headform Resultant



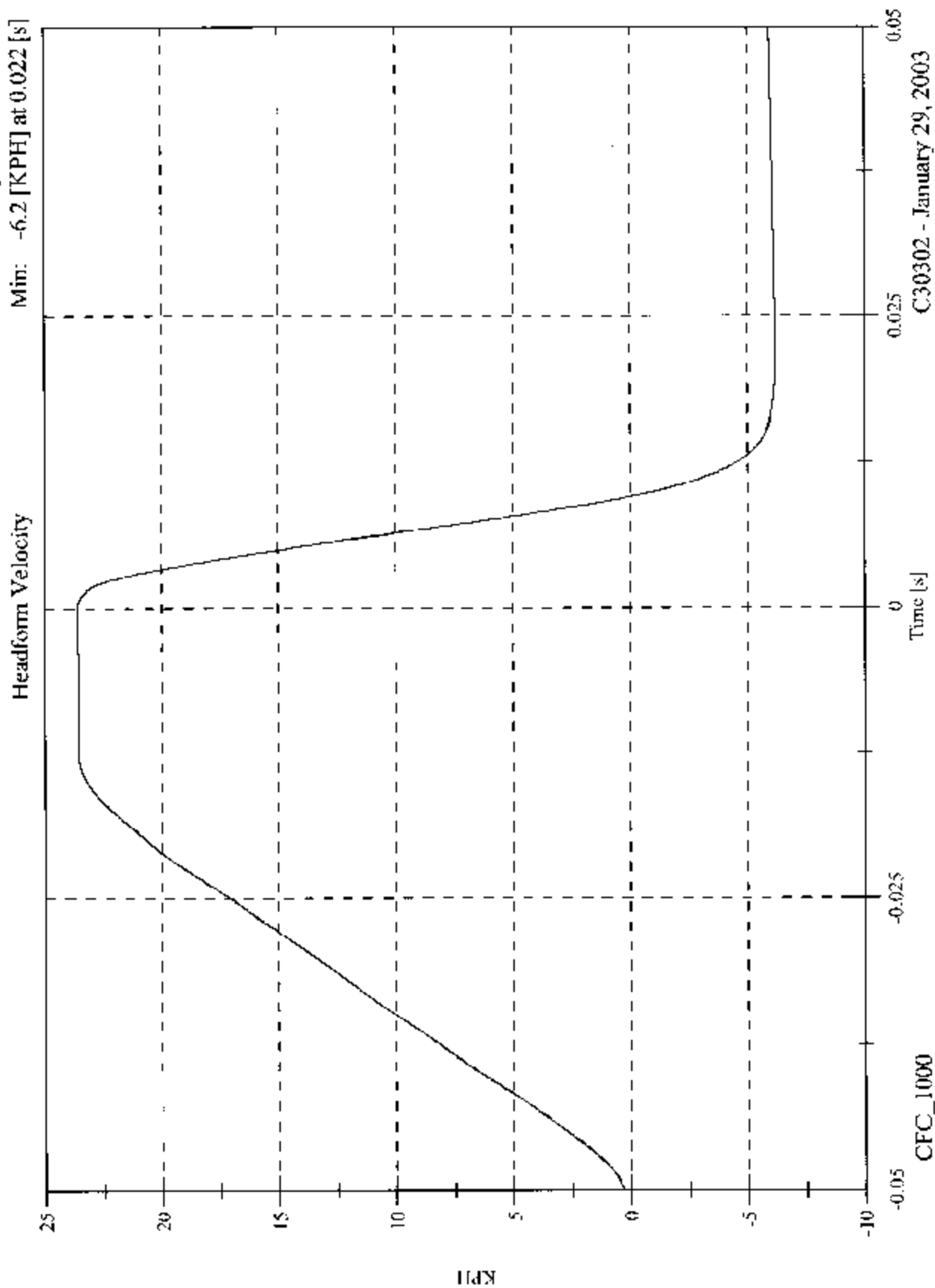
C30302 - January 29, 2003

1 MVSS 201U IMPACT TEST - 2003 JEEP LIBERTY

Max: 23.6 [KPH] at 0.000 [s]

Min: -6.2 [KPH] at 0.022 [s]

Headform Velocity



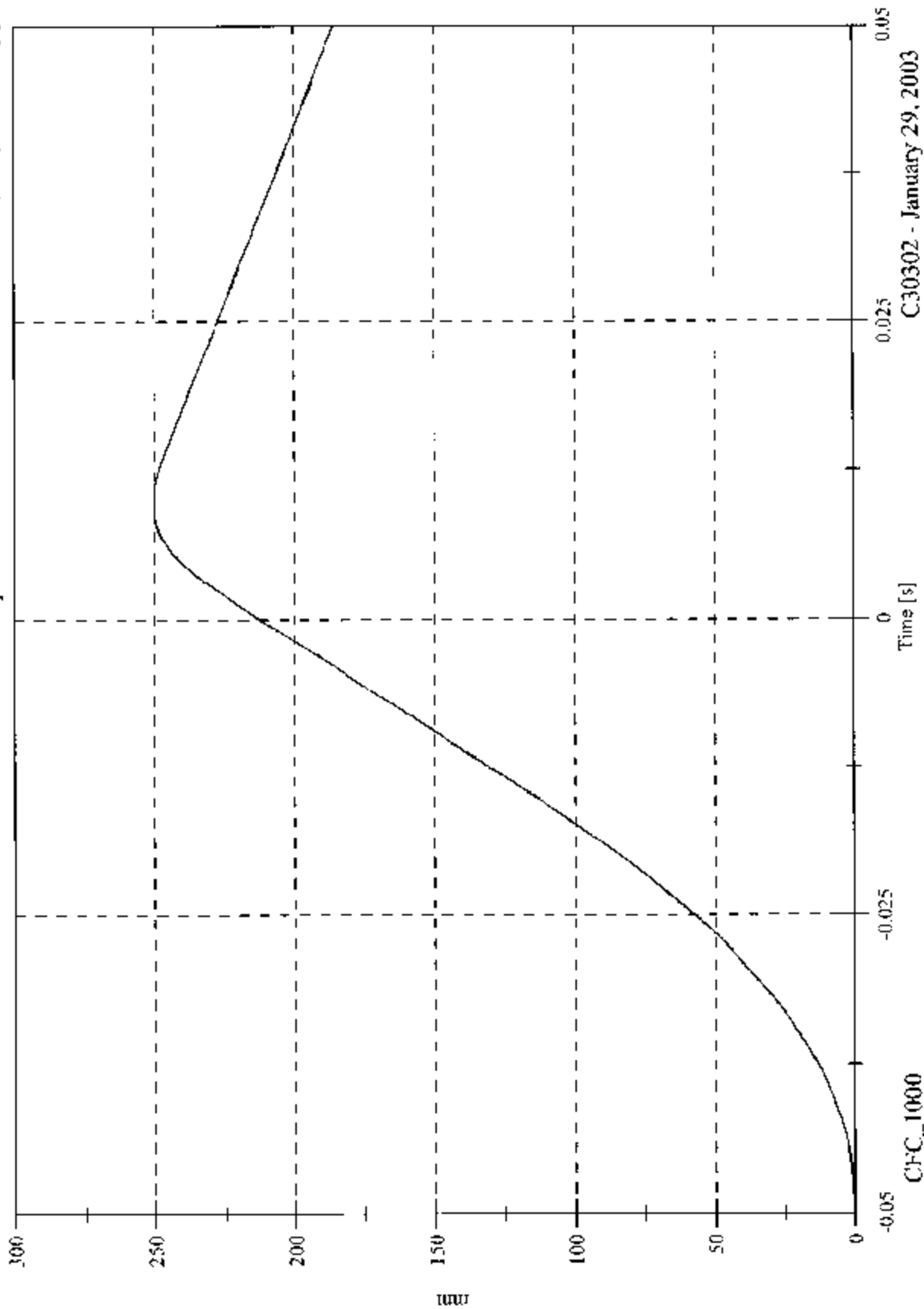
CFC_1000

FMVSS 201U IMPACT TEST - 2003 JEEP LIBERTY

Headform Displacement

Max: 250.3 [mm] at 0.010 [s]

Min: 0.2 [mm] at -0.050 [s]



C30302 - January 29, 2003

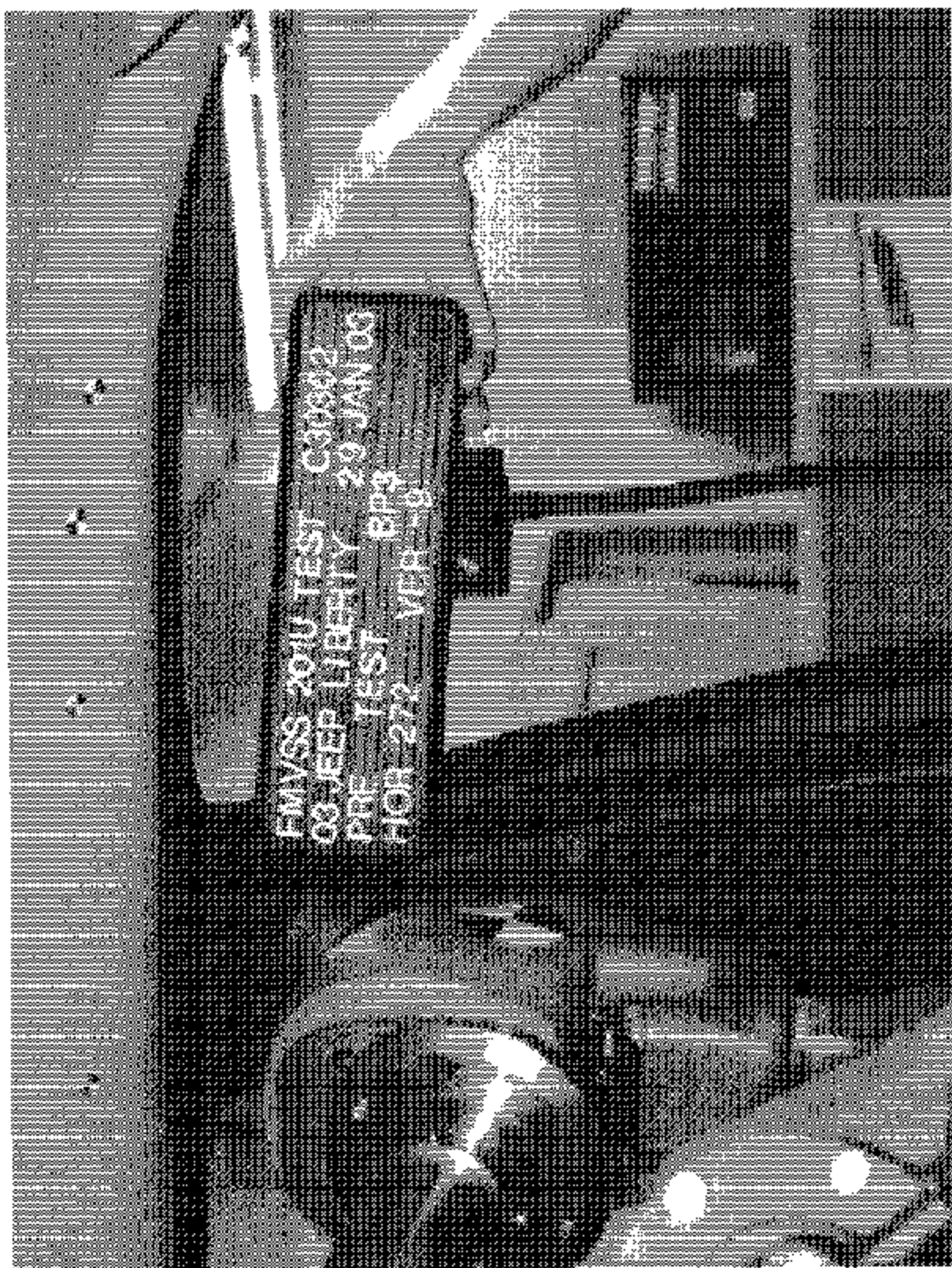


Figure 1: PRE-TEST 003



Figure 1: POST-CRASH

FMVSS 201U TEST C30302
03 JEEP LIBERTY 29 JAN 03
POST TEST BP3
HOR 272 VEH -9

Figure : BP3 HEADFORM

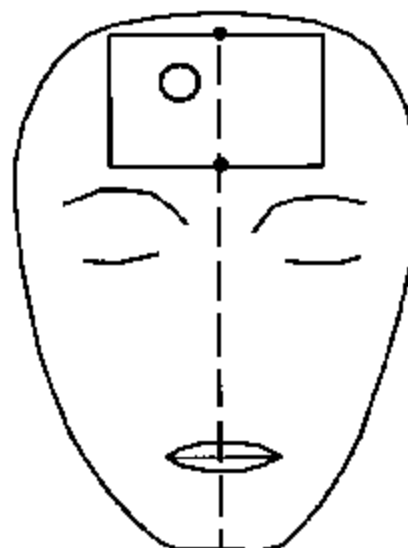
Year/Make/Model/Body Style: 2003 Jeep Liberty 4-door
 Vehicle Body Color: Red VIN: 1J4GL48183W539150
 Vehicle NHTSA No.: C30302 Month & Year of Manufacture: 9/2002

Test Number: 10 Test Date: 1/29/03
 Target Location: UPPER ROOF Target Code: URB1*
 Horizontal Impact Angle: 270 ° Vertical Impact Angle: 45 °
 Ambient Temperature: 22 °C Time of Impact: 15:06
 Headform Number: 0642

Impact Point:

Description:

Description: From lower midpoint				
On centerline	53	mm up		
On centerline	7	x	mm right	- mm left



Free Motion HIC: 1041.3 HIC(d): 952.0
 Impact Velocity (kph): 23.8 HIC1 2.0 msec HIC2 9.0 msec

Post-Test Comments:

FMVSS 201U IMPACT TEST - 2003 JEEP LIBERTY C30302 - URBP

FMH Headform 0642

Location: URBP

Test Date: January 29, 2003

Work File: URBP

-----TEST RESULTS-----

Lab Temperature: 22 C

HICd: 952.0

Lab Humidity: 14 %

HIC (36ms): 1041.3

Velocity at Impact: 23.80 KPH

t1: 2.9 msec

t2: 9.0 msec

Free Flight Distance: 216.75 mm

Duration: 6.1 msec

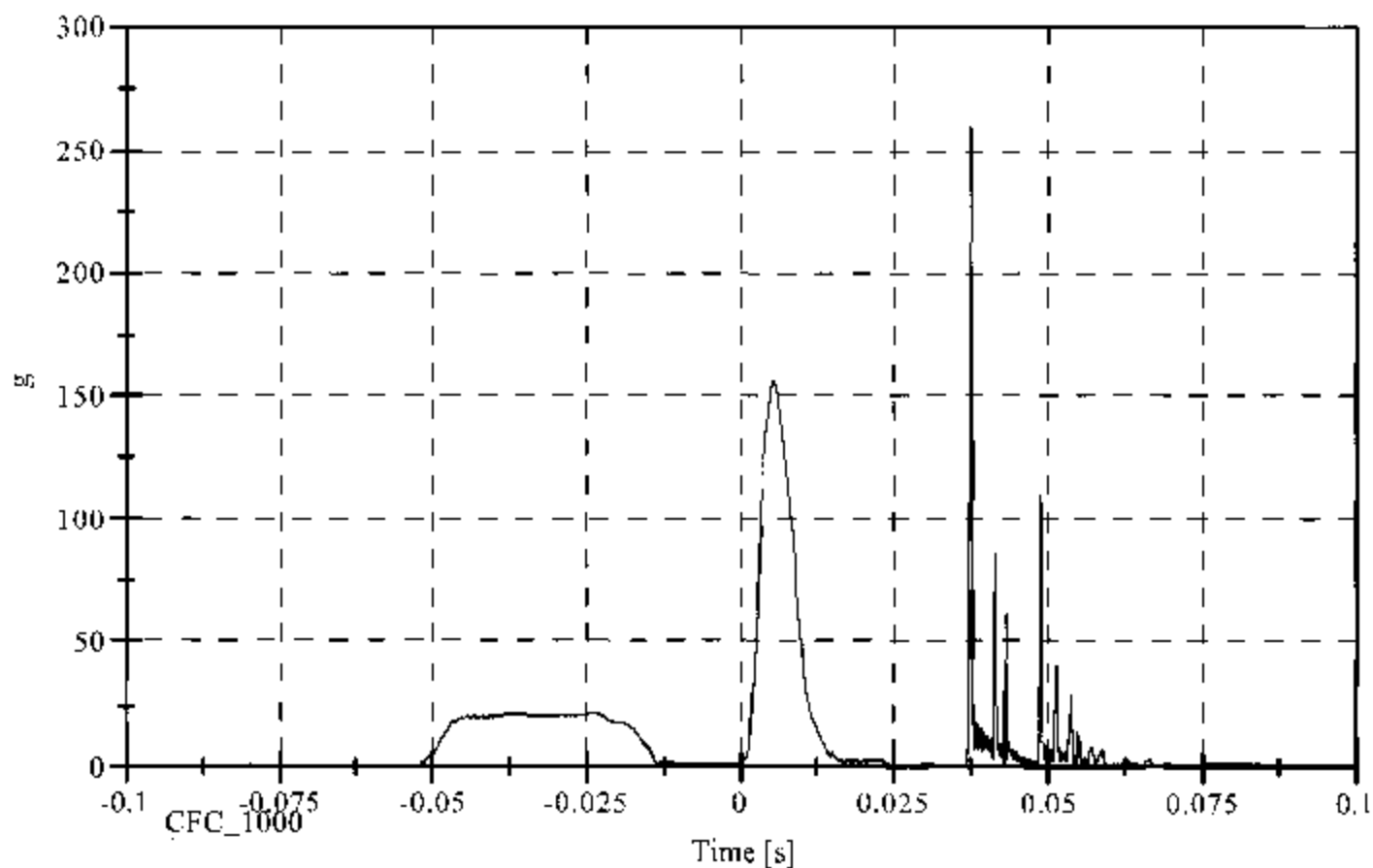
Average Acceleration: 10.4 g

FMVSS 201U IMPACT TEST - 2003 JEEP LIBERTY

Headform Resultant

Max: 259.5 [g] at 0.037 [s]

Min: 0.0 [g] at -0.089 [s]

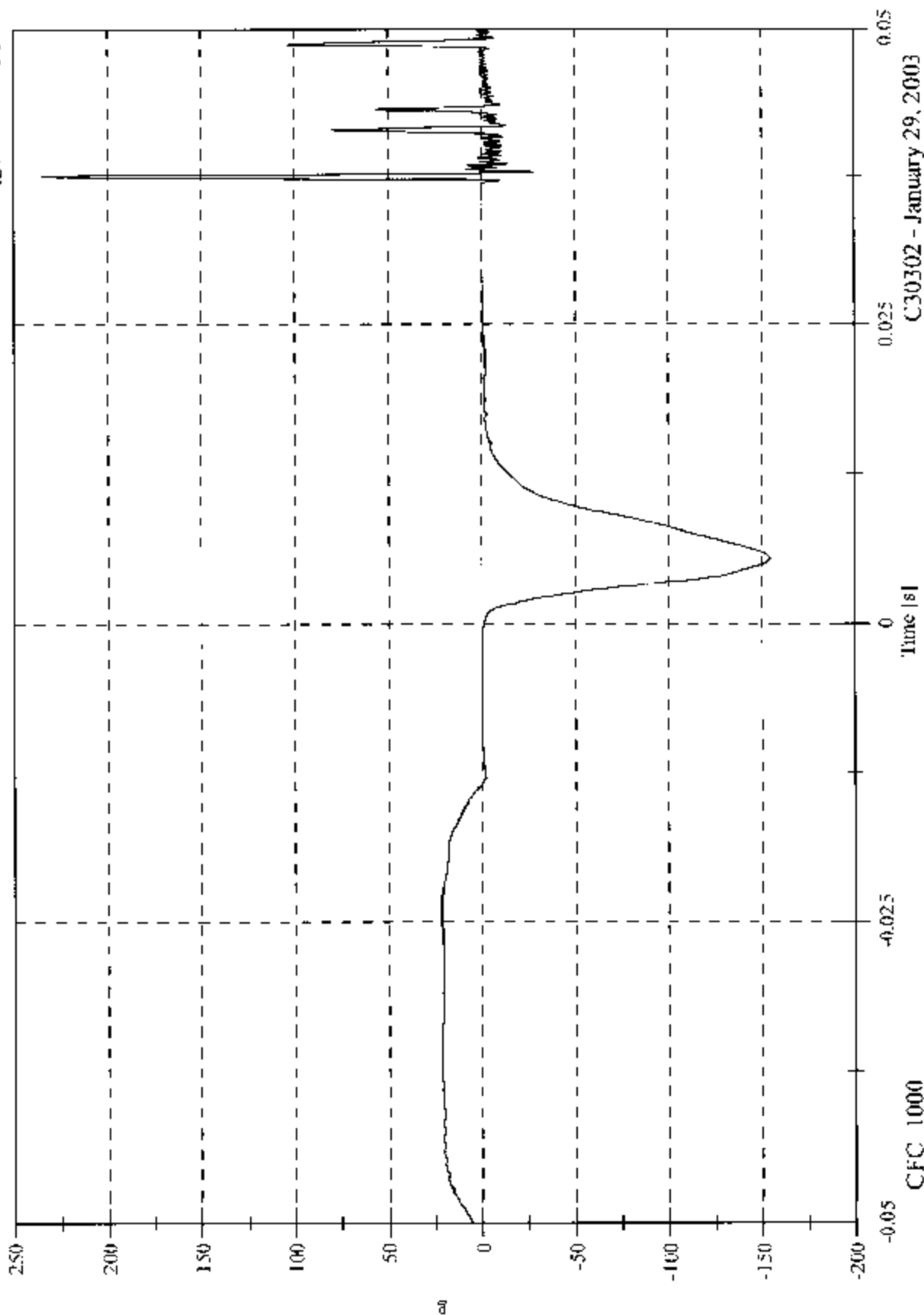


FMVSS 2010 IMPACT TEST - 2003 JEEP LIBERTY

Headform X Acceleration

Max: 234.6 [g] at 0.037 [s]

Min: -154.5 [g] at 0.005 [s]



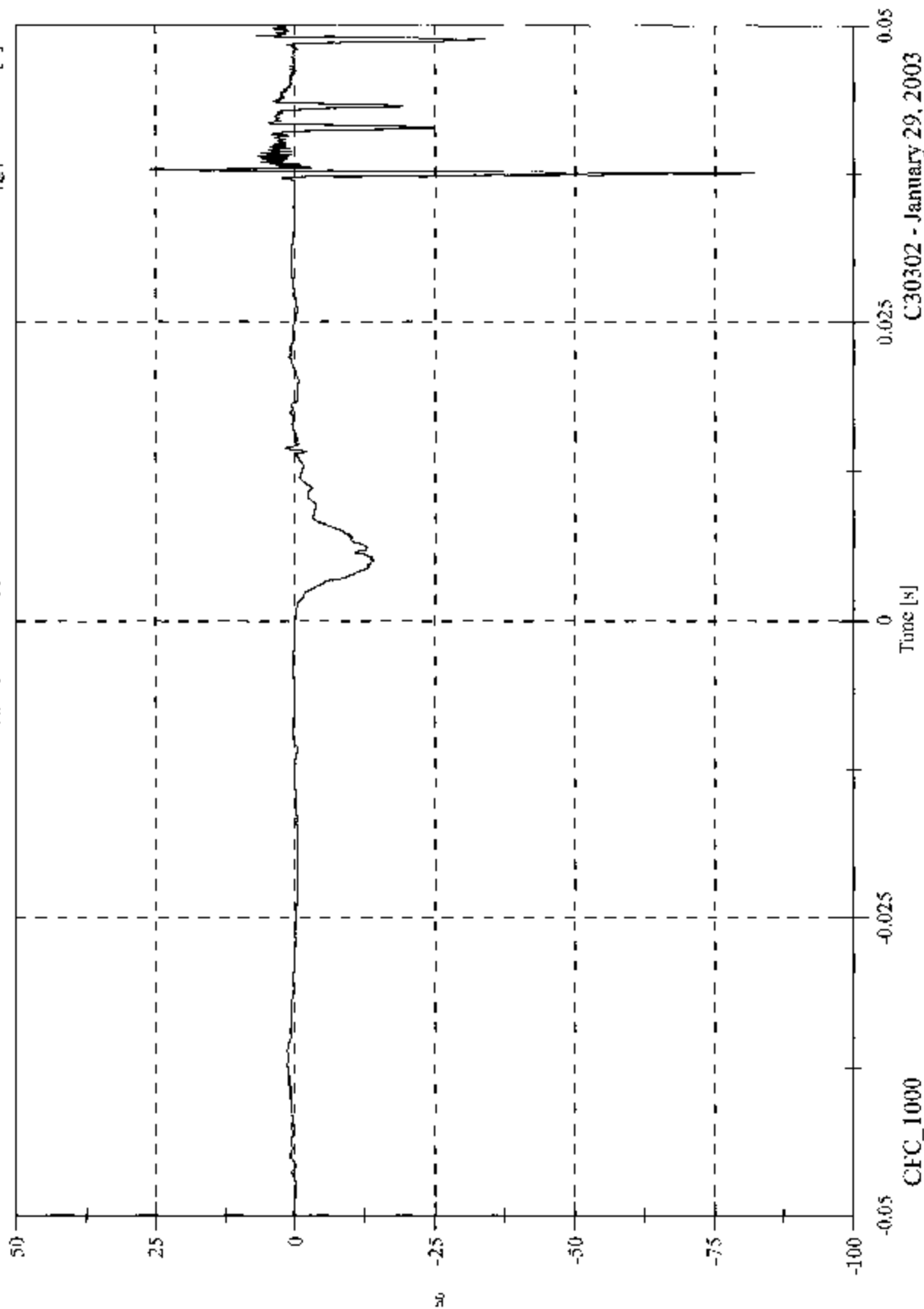
C30302 - January 29, 2003

FMVSS 201U IMPACT TEST - 2003 JEEP LIBERTY

Headform Y Acceleration

Max: 26.0 [g] at 0.038 [s]

Min: -82.3 [g] at 0.038 [s]

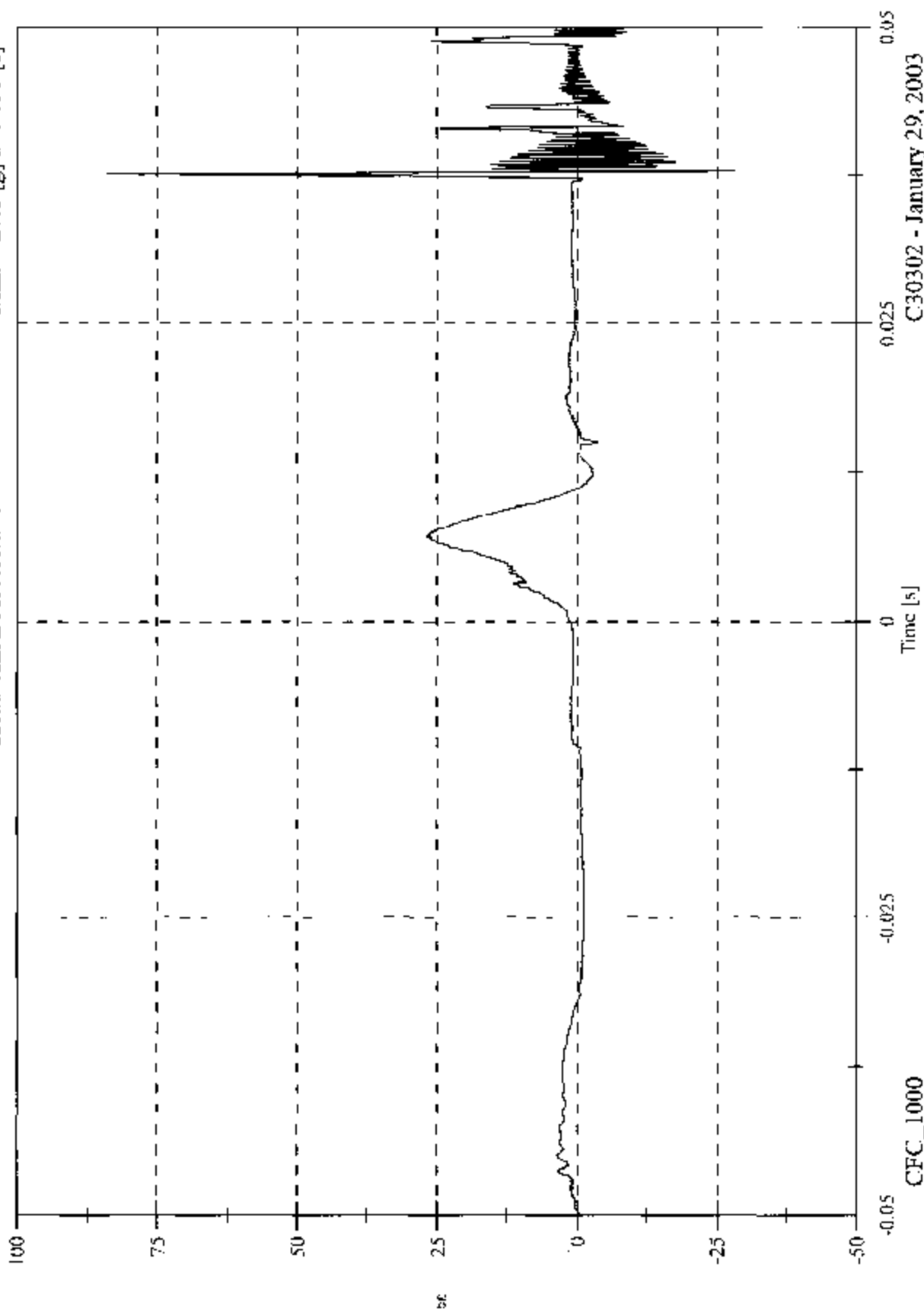


C30302 - January 29, 2003

FMVSS 201U IMPACT TEST - 2003 JEEP LIBERTY

Headform Z Acceleration

Max: 83.7 [g] at 0.038 [s]
Min: -27.8 [g] at 0.038 [s]



CFC_1000

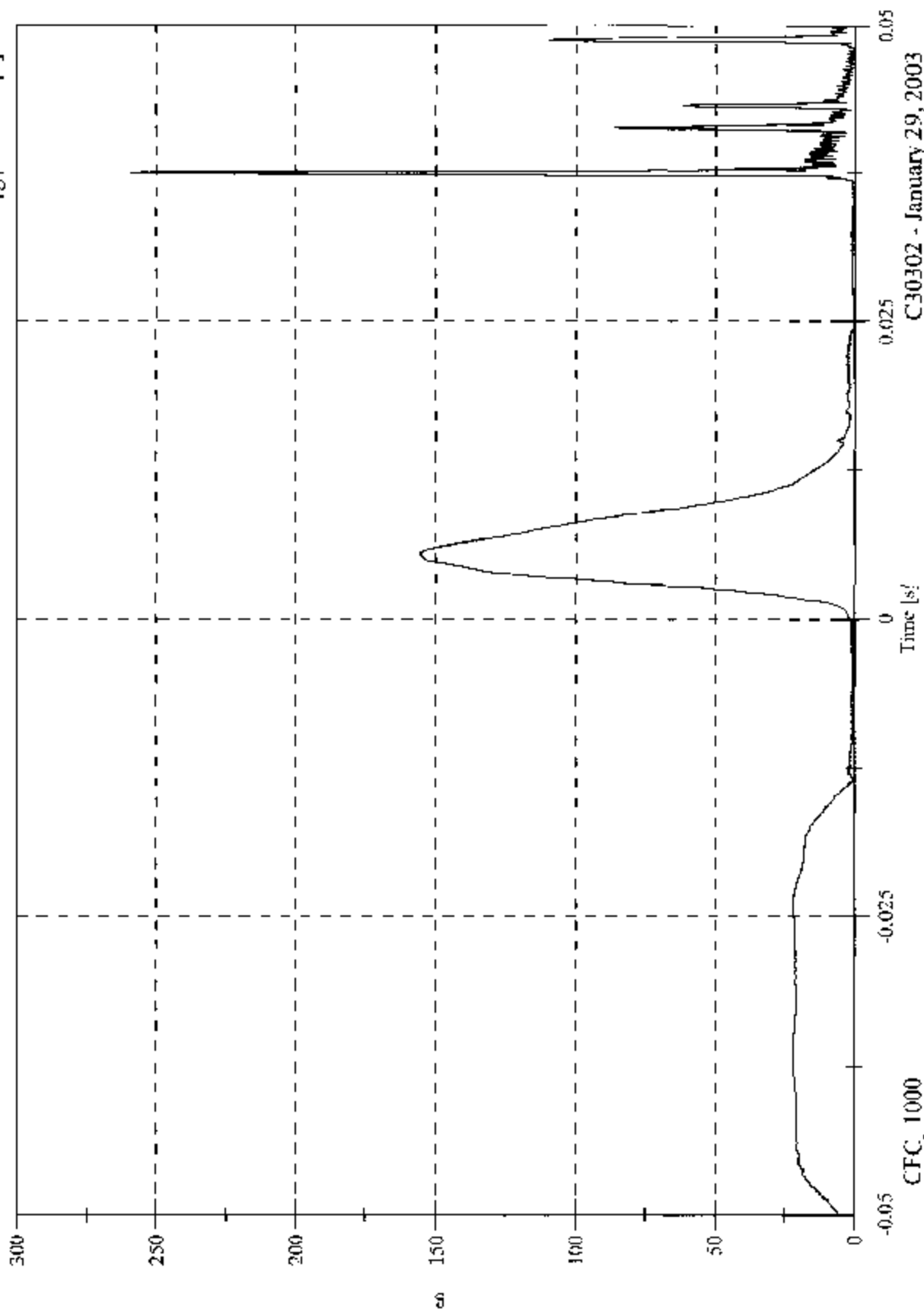
Time [s]

C30302 - January 29, 2003

FMVSS 201U IMPACT TEST - 2003 JEEP LIBERTY

Headform Resultant

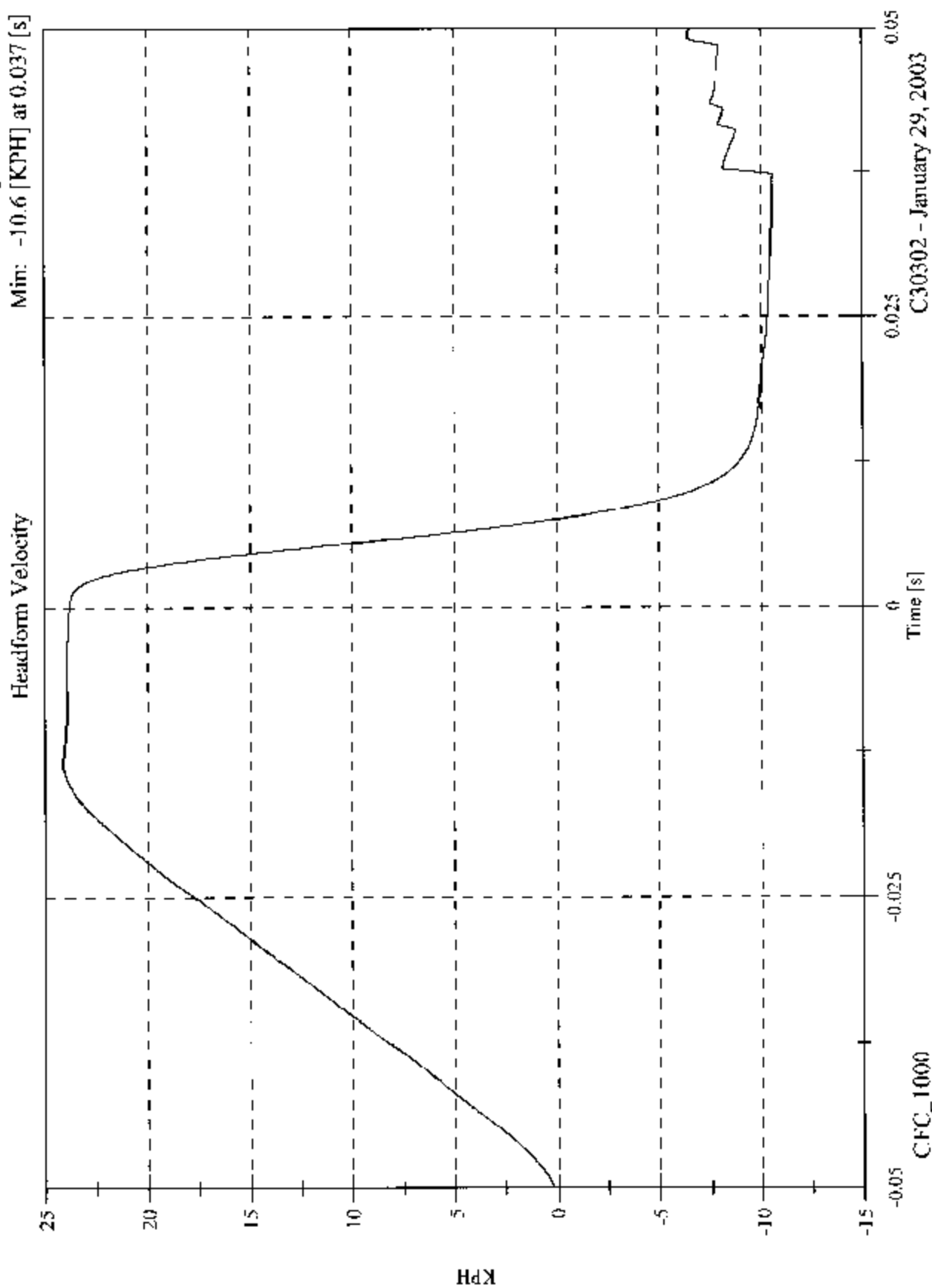
Max: 259.5 [g] at 0.037 [s]
Min: 0.2 [g] at 0.047 [s]



C30302 - January 29, 2003

FMVSS 2010 IMPACT TEST - 2003 JEEP LIBERTY

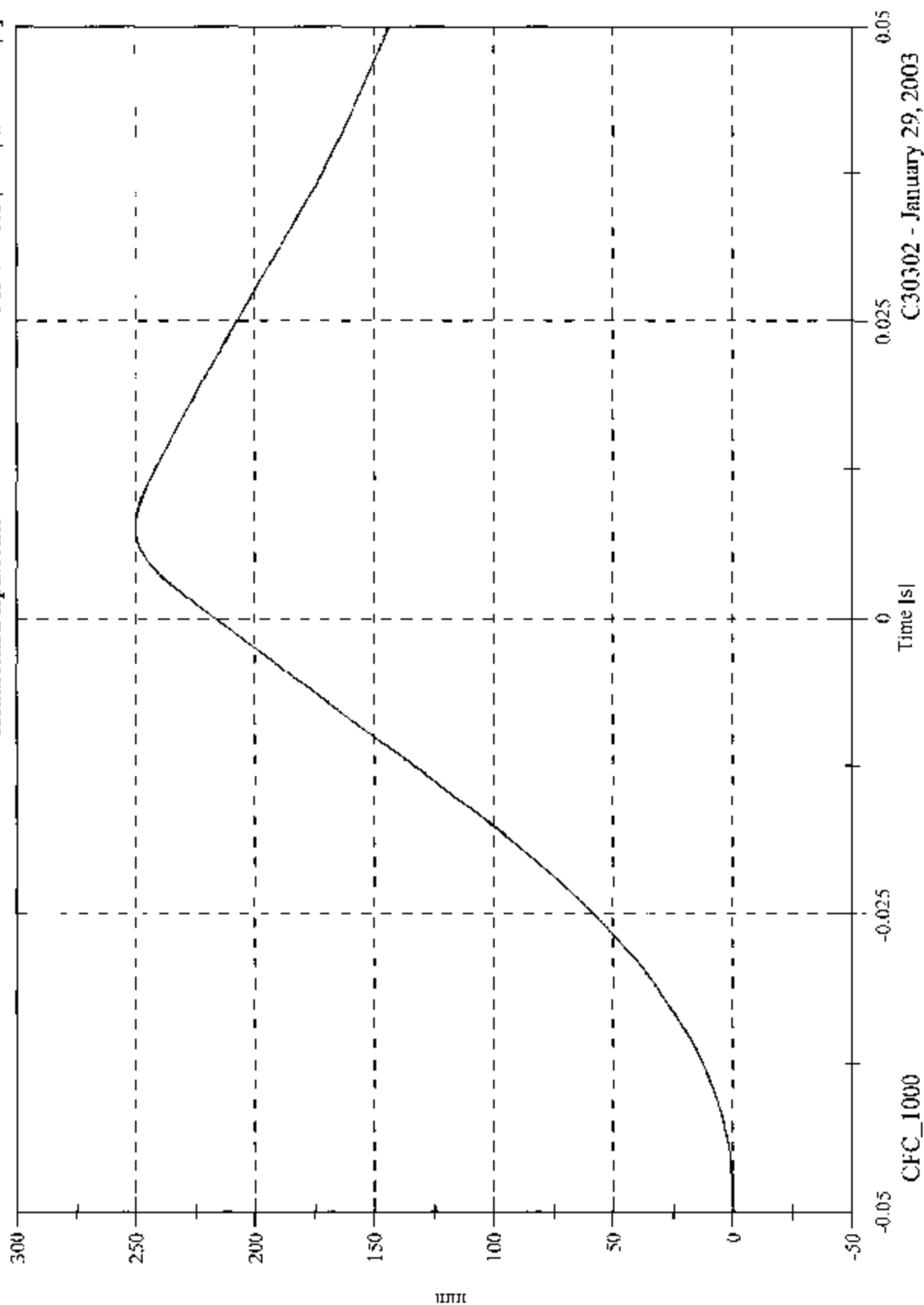
Max: 24.1 [KPH] at -0.014 [s]
Min: -10.6 [KPH] at 0.037 [s]



FMVSS 201U IMPACT TEST - 2003 JHEP LIBERTY

Max: 250.2 [mm] at 0.008 [s]
Min: -0.1 [mm] at -0.050 [s]

Headform Displacement



C30302 - January 29, 2003

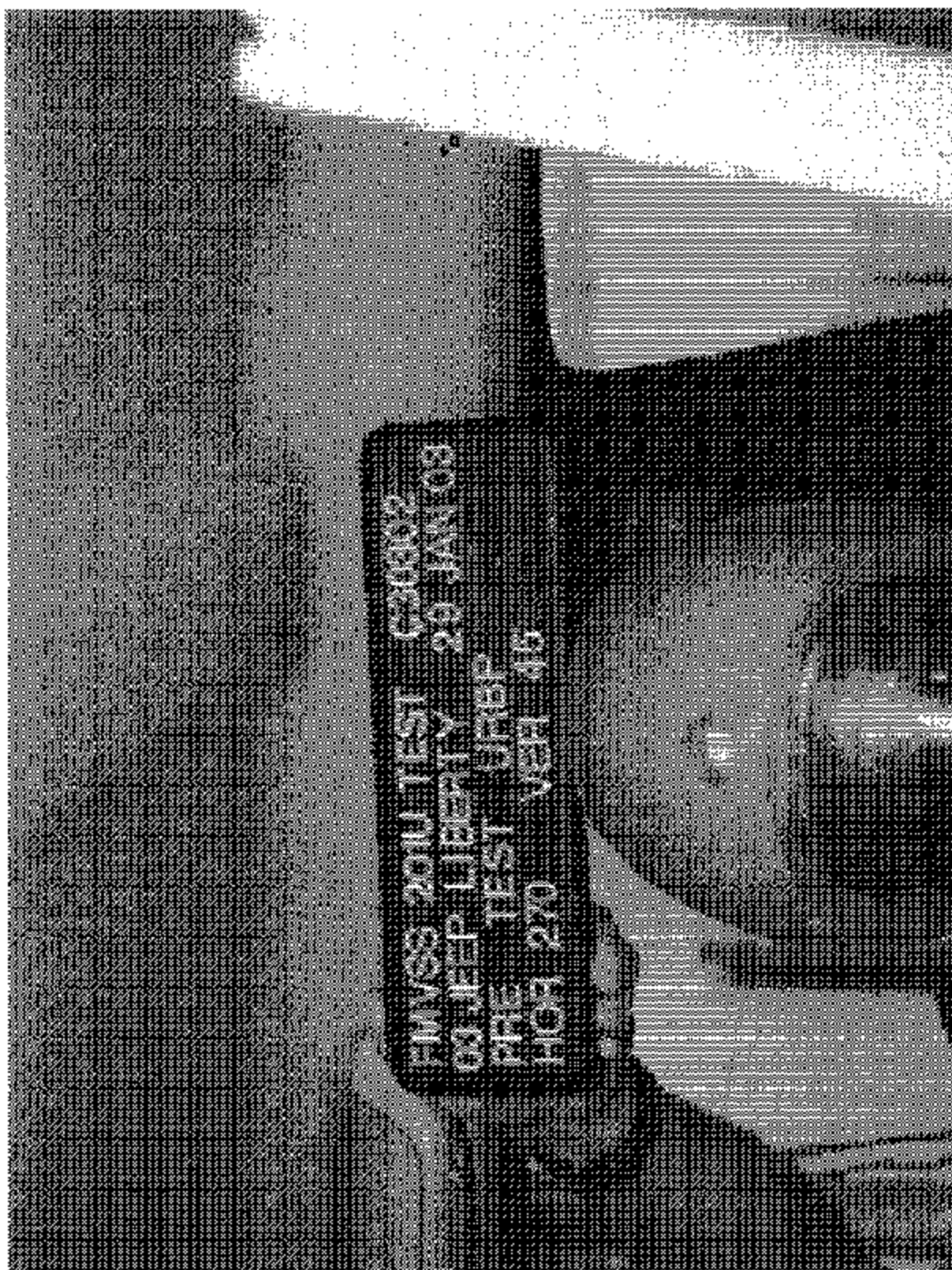


Figure : PRE-TEST URB

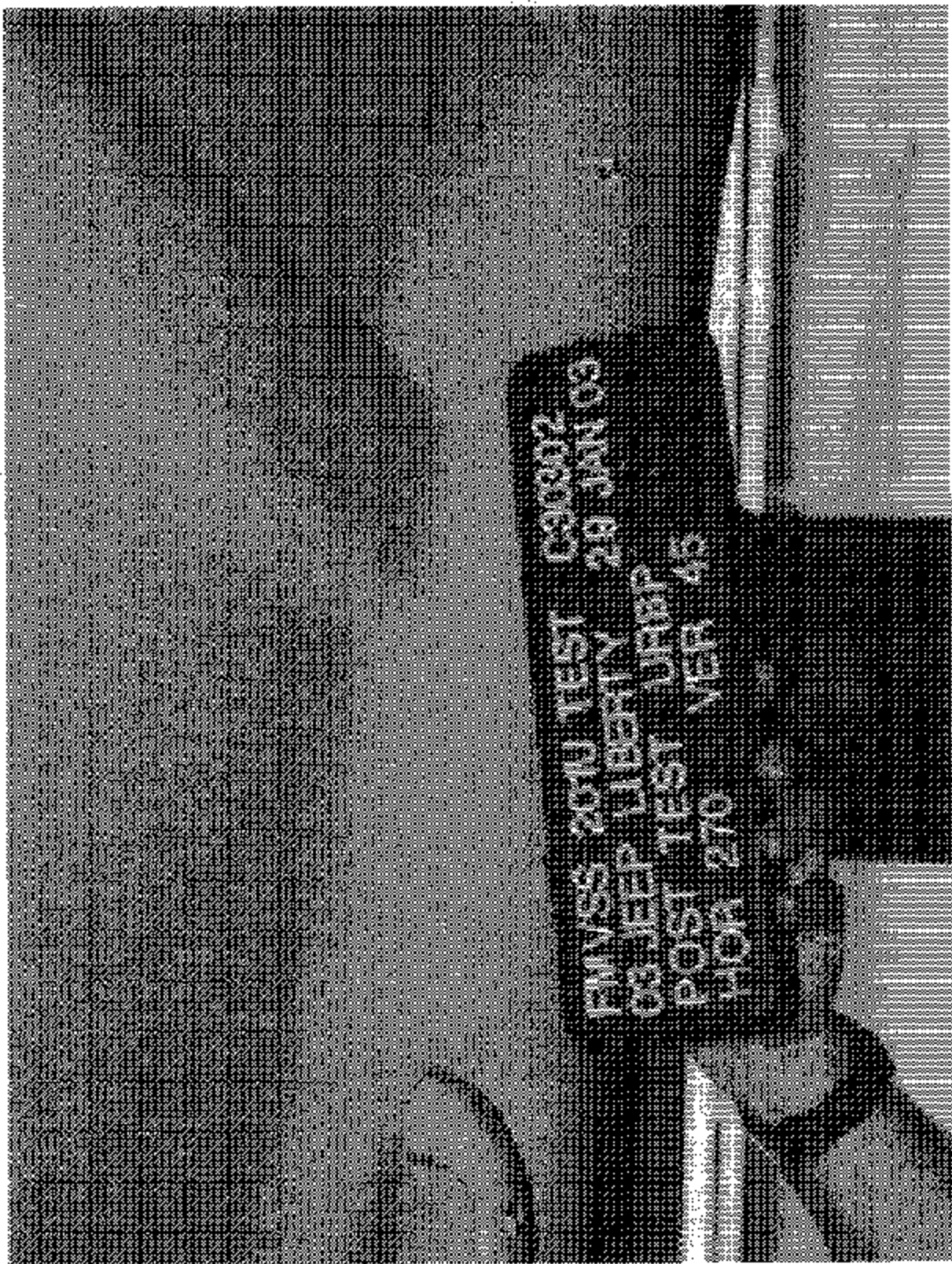


Figure : POST-TEST UEP

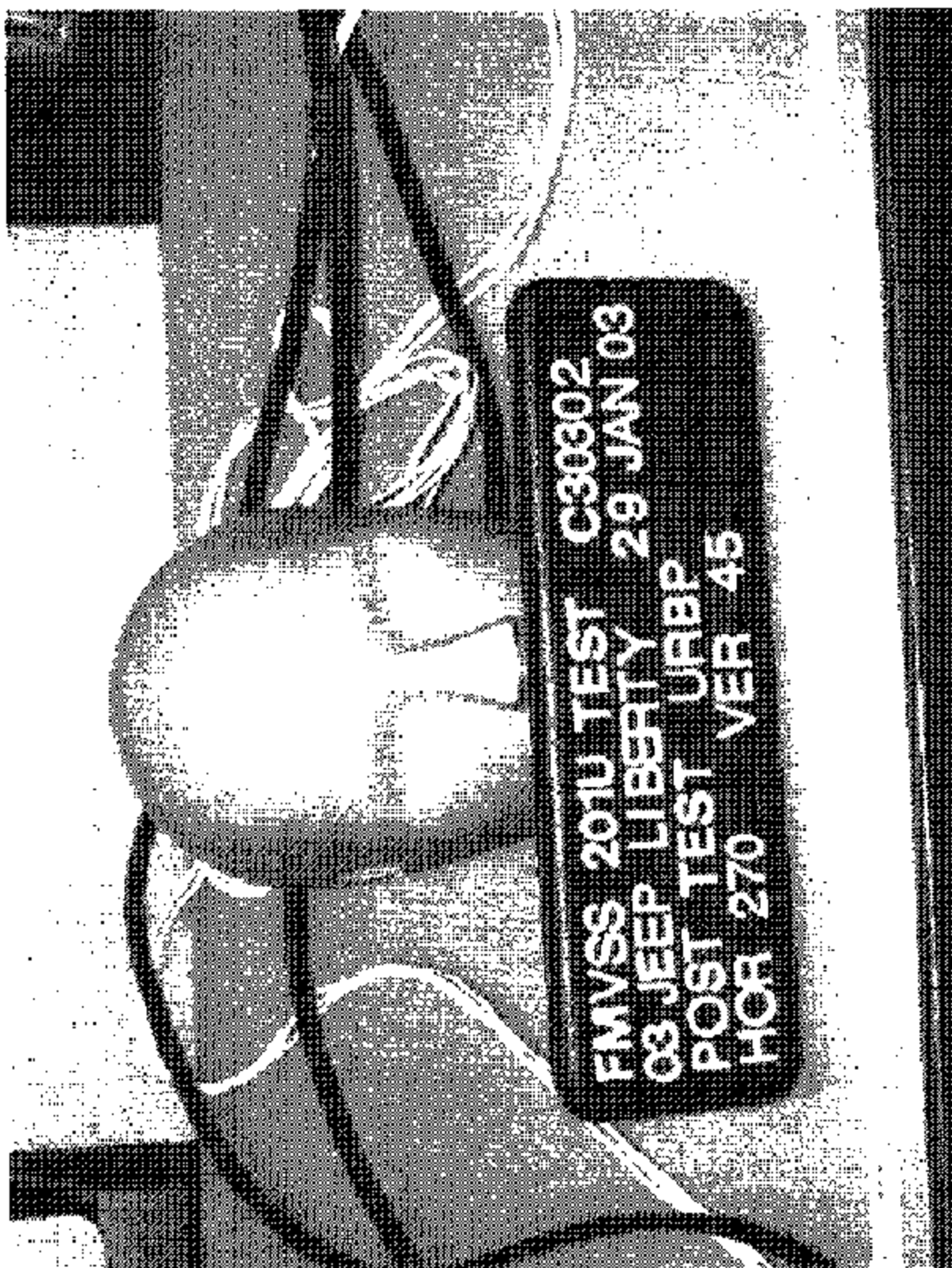


Figure 1. URBAN TEST

APPENDIX A

PHOTOGRAPHS

PHOTOGRAPHS

FIGURE	VIEW
A-1	LEFT SIDE VIEW OF VEHICLE
A-2	RIGHT SIDE VIEW OF VEHICLE
A-3	3/4 FRONTAL VIEW FROM LEFT SIDE OF VEHICLE
A-4	3/4 REAR VIEW FROM RIGHT SIDE OF VEHICLE
A-5	VEHICLE'S CERTIFICATION LABEL
A-6	VEHICLE'S TIRE INFORMATION LABEL
A-7	PRE-TEST DRIVER SIDE A-PILLAR
A-8	PRE-TEST DRIVER SIDE FRONT HEADER
A-9	PRE-TEST DRIVER SIDE SIDE RAIL
A-10	PRE-TEST DRIVER SIDE B-PILLAR
A-11	PRE-TEST DRIVER SIDE REAR GRAB HANDLE
A-12	PRE-TEST DRIVER SIDE OTHER PILLAR
A-13	PRE-TEST DRIVER SIDE REAR PILLAR
A-14	PRE-TEST PASSENGER SIDE A-PILLAR
A-15	PRE-TEST PASSENGER SIDE FRONT HEADER
A-16	PRE-TEST PASSENGER SIDE SIDE RAIL
A-17	PRE-TEST PASSENGER SIDE B-PILLAR
A-18	PRE-TEST PASSENGER SIDE REAR GRAB HANDLE
A-19	PRE-TEST PASSENGER SIDE OTHER PILLAR
A-20	PRE-TEST PASSENGER SIDE REAR PILLAR
A-21	POST-TEST DRIVER SIDE A-PILLAR
A-22	POST-TEST DRIVER SIDE FRONT HEADER
A-23	POST-TEST DRIVER SIDE SIDE RAIL
A-24	POST-TEST DRIVER SIDE B-PILLAR
A-25	POST-TEST DRIVER SIDE REAR GRAB HANDLE
A-26	POST-TEST DRIVER SIDE OTHER PILLAR
A-27	POST-TEST DRIVER SIDE REAR PILLAR
A-28	POST-TEST PASSENGER SIDE A-PILLAR
A-29	POST-TEST PASSENGER SIDE FRONT HEADER
A-30	POST-TEST PASSENGER SIDE SIDE RAIL
A-31	POST-TEST PASSENGER SIDE B-PILLAR
A-32	POST-TEST PASSENGER SIDE REAR GRAB HANDLE
A-33	POST-TEST PASSENGER SIDE OTHER PILLAR
A-34	POST-TEST PASSENGER SIDE REAR PILLAR

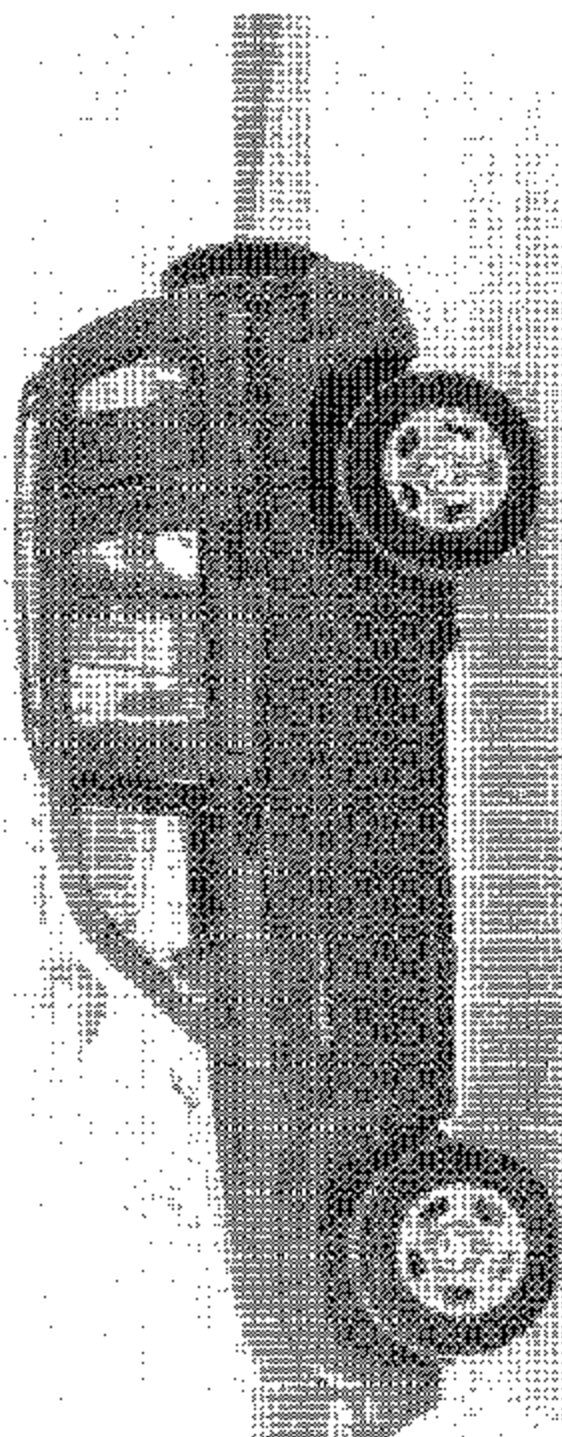


Figure 1 LEFT SIDE VIEW OF VEHICLE

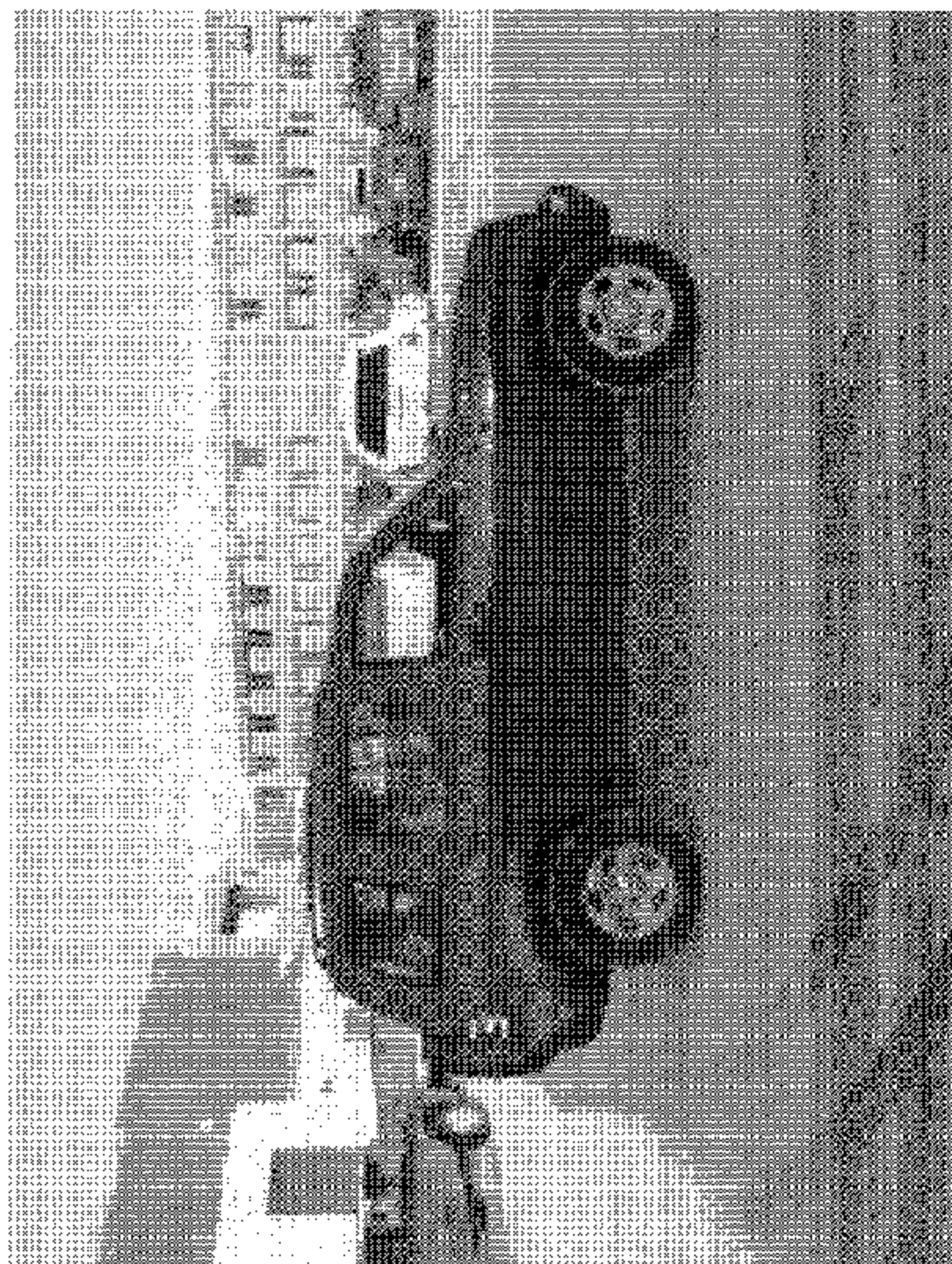


Figure : RIGHT SIDE VIEW OF VEHICLE

Figure : 3/4 FRONTAL VIEW FROM LEFT SIDE OF VEHICLE

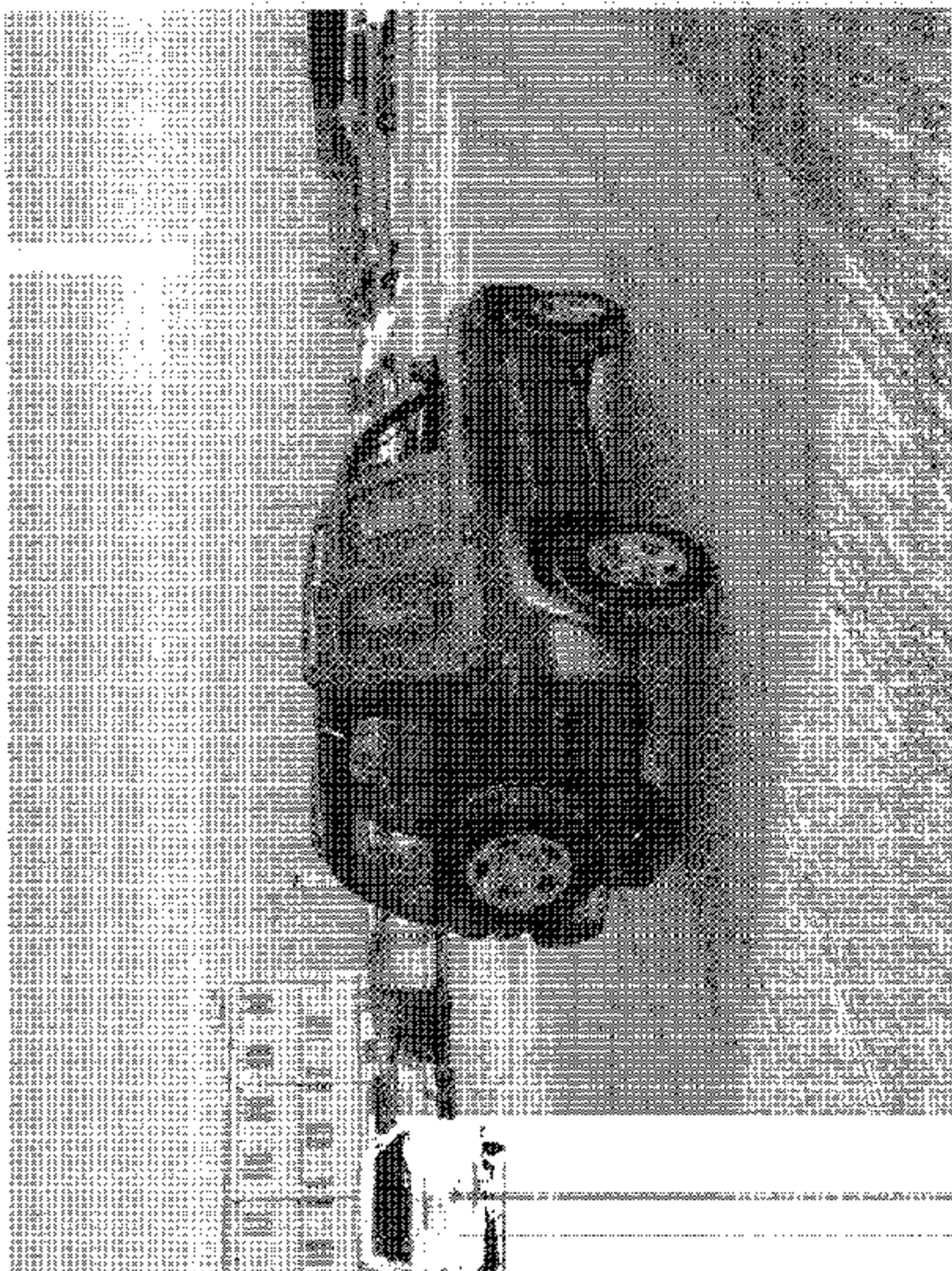


Figure : 3/4 REAR VIEW FROM RIGHT SIDE OF VEHICLE



Figure PRE-TEST DRIVER SIDE A-PILLAR



Figure 1 PRE-TEST DRIVER SIDE FRONT HEADER



Figure PRE-TEST DRIVER SIDE SIDE RAIL



Figure 1 PRE-TEST DRIVER SIDE B-PILLAR



Figure : PRE-TEST DRIVER SIDE REAR GRAB HANDLE

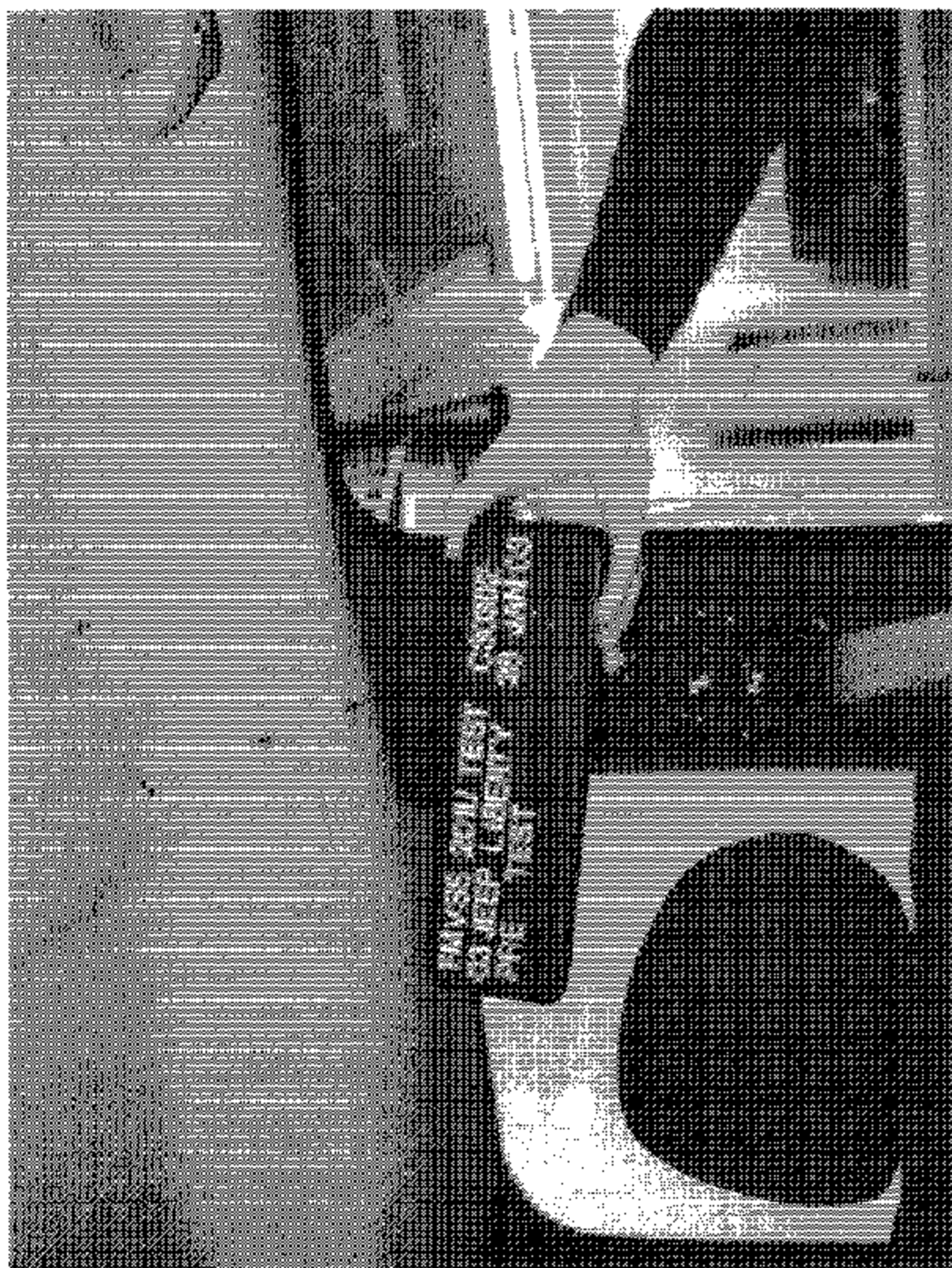


Figure 1. PRE-TENSIONED CONCRETE BEAM SIDE FILLER

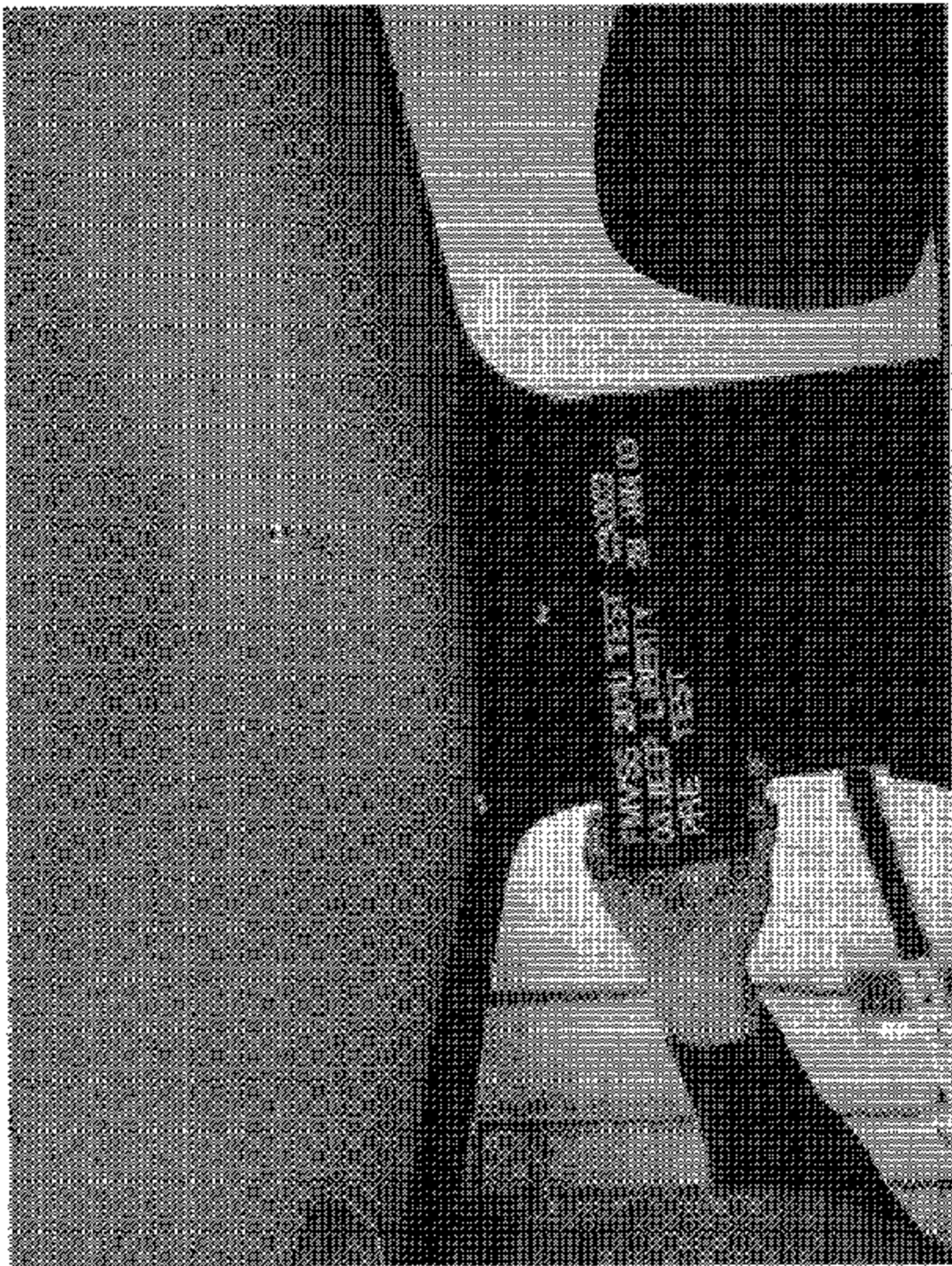


Figure : PRE-TEST DRIVER SIDE REAR PILLAR

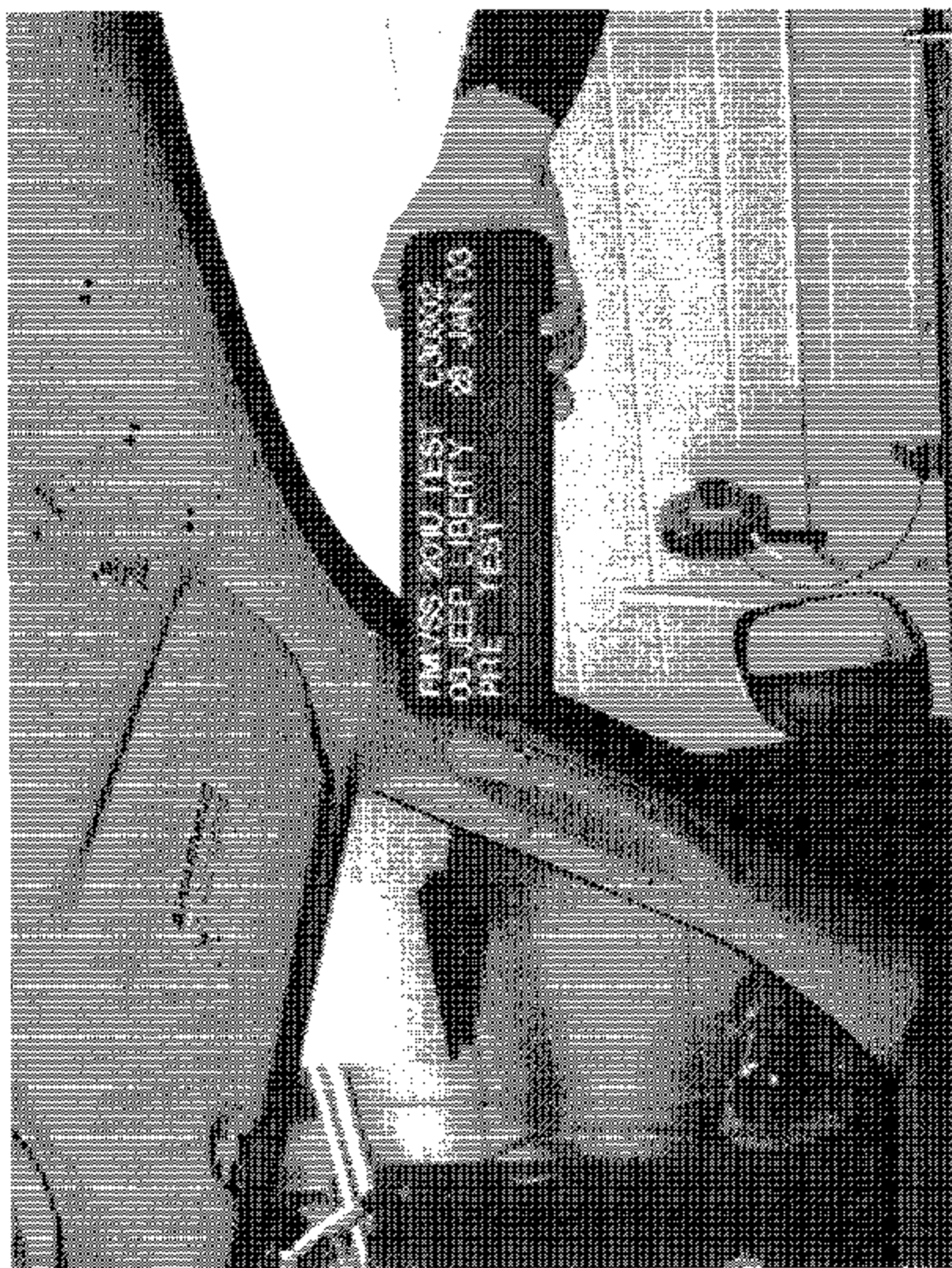


Figure 7. PRE-TEST PASSENGER SIDE A-PILLAR



Figure : FEL-TENT PASSENGER SIDE FRONT HEADER



Figure 1 PRE-TEST PASSENGER SIDE RAIL

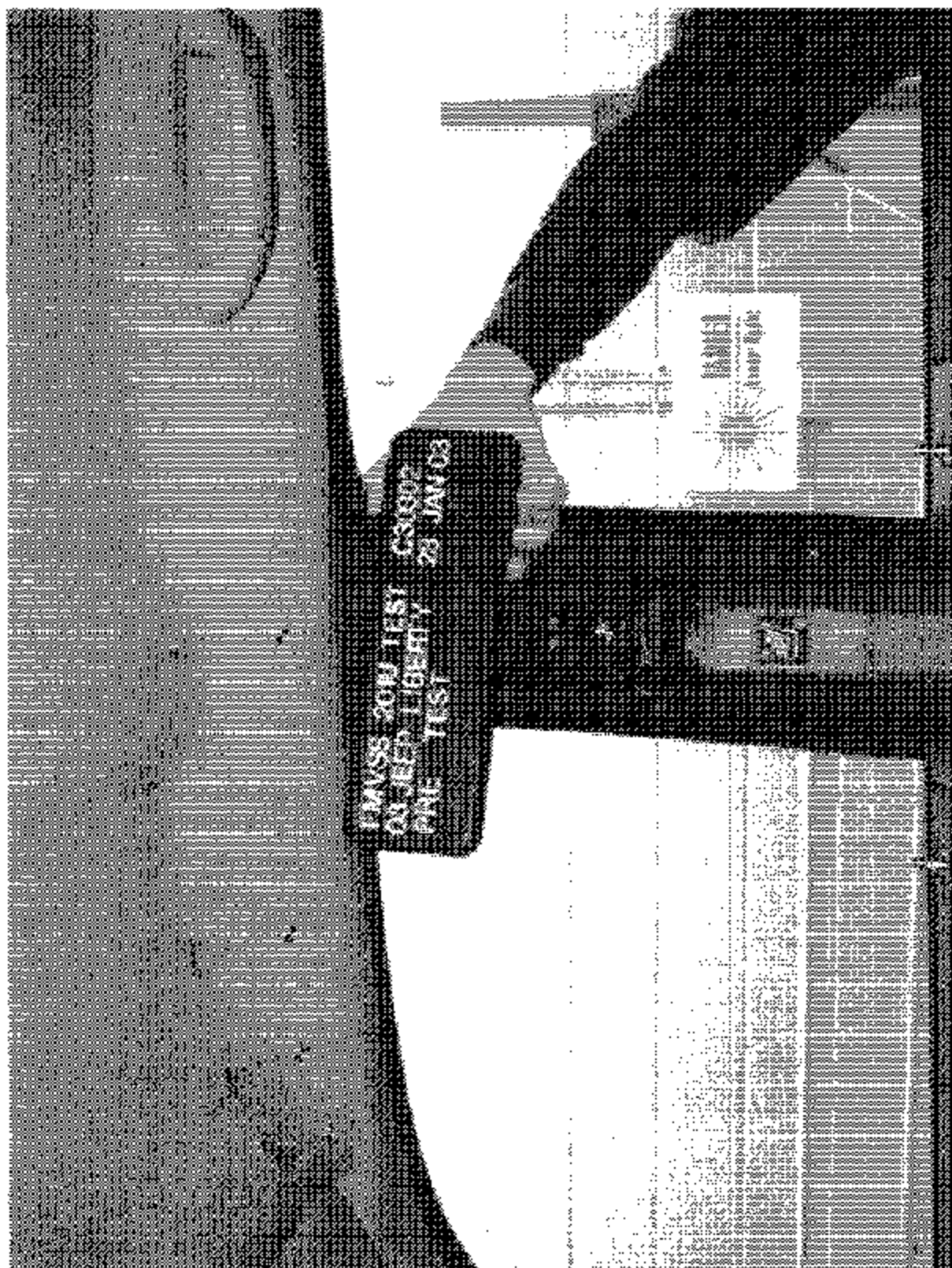


Figure 1. PRE-TEST PASSENGER SIDE B-PILLAR



Figure 1. PRE-TEST PASSENGER SIDE REAR GRAB HANDLE



Figure : PRE-101 PASSENGER SIDE OTHER PILLAR

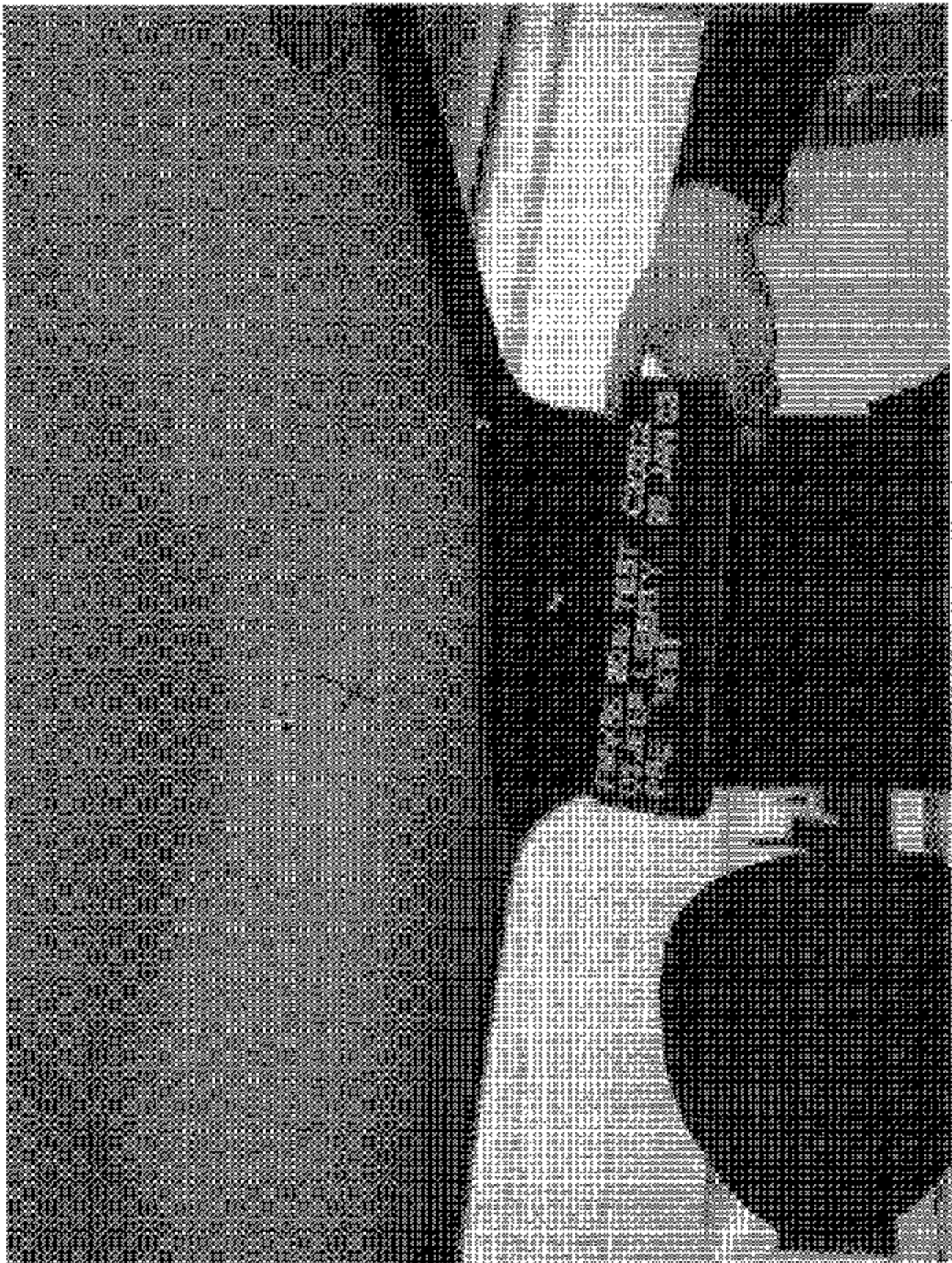


Figure 1: PRE-TEST PASSENGER SIDE REAR PILAR

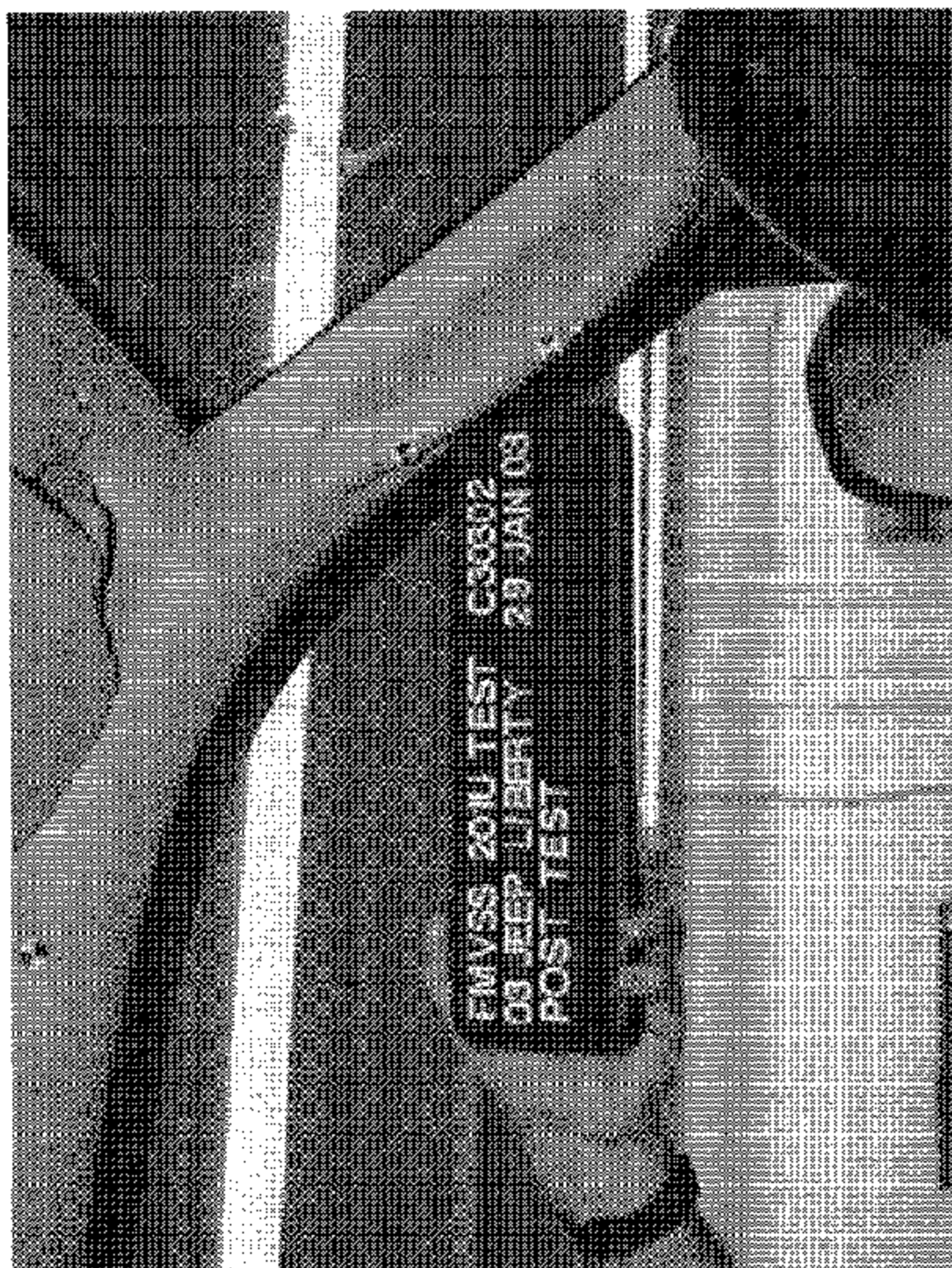


Figure : POST-TEST DRIVER SIDE A-PILLAR

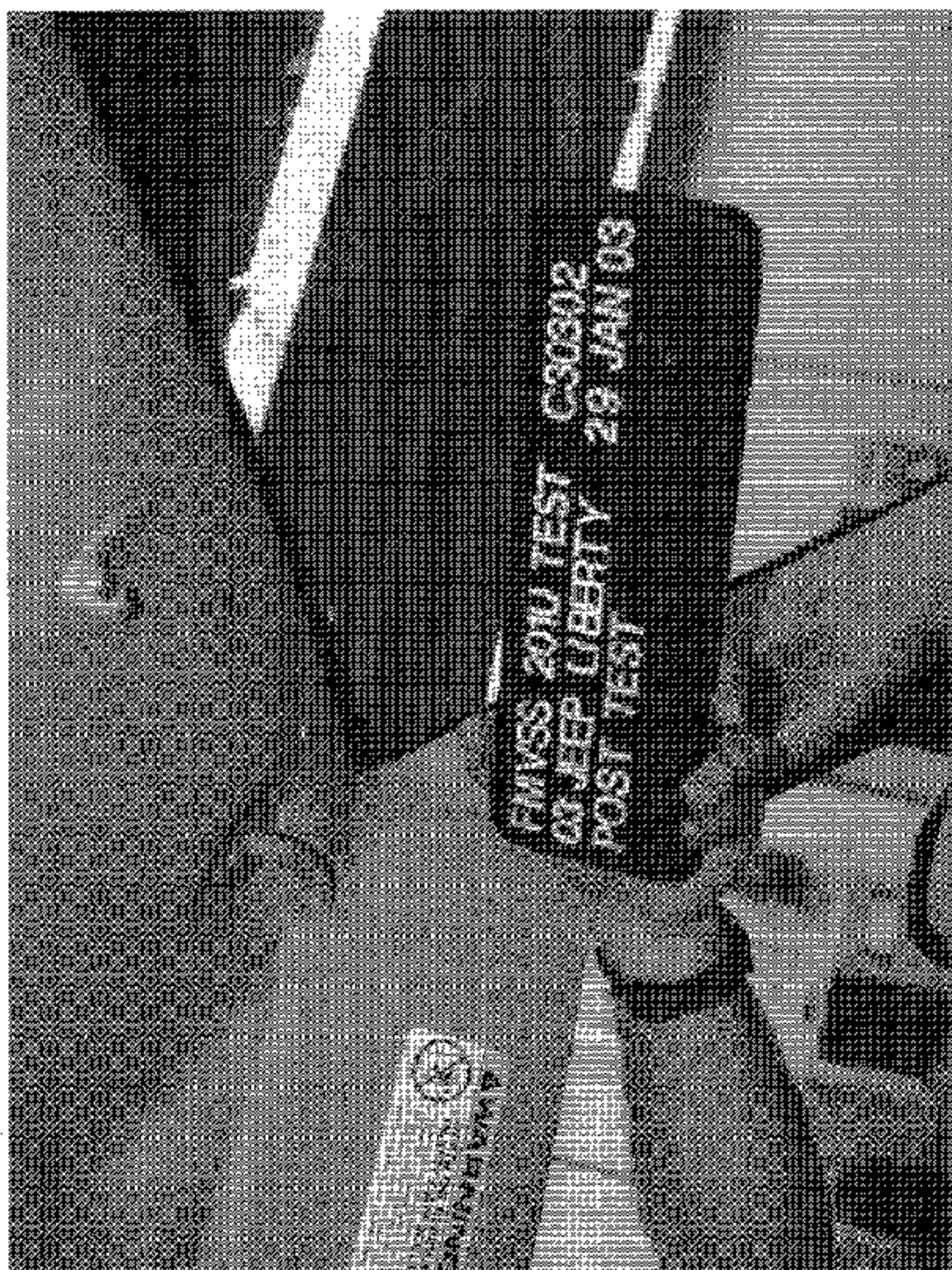


Figure 1. POST-TEST DRIVER SIDE FRONT HEADER

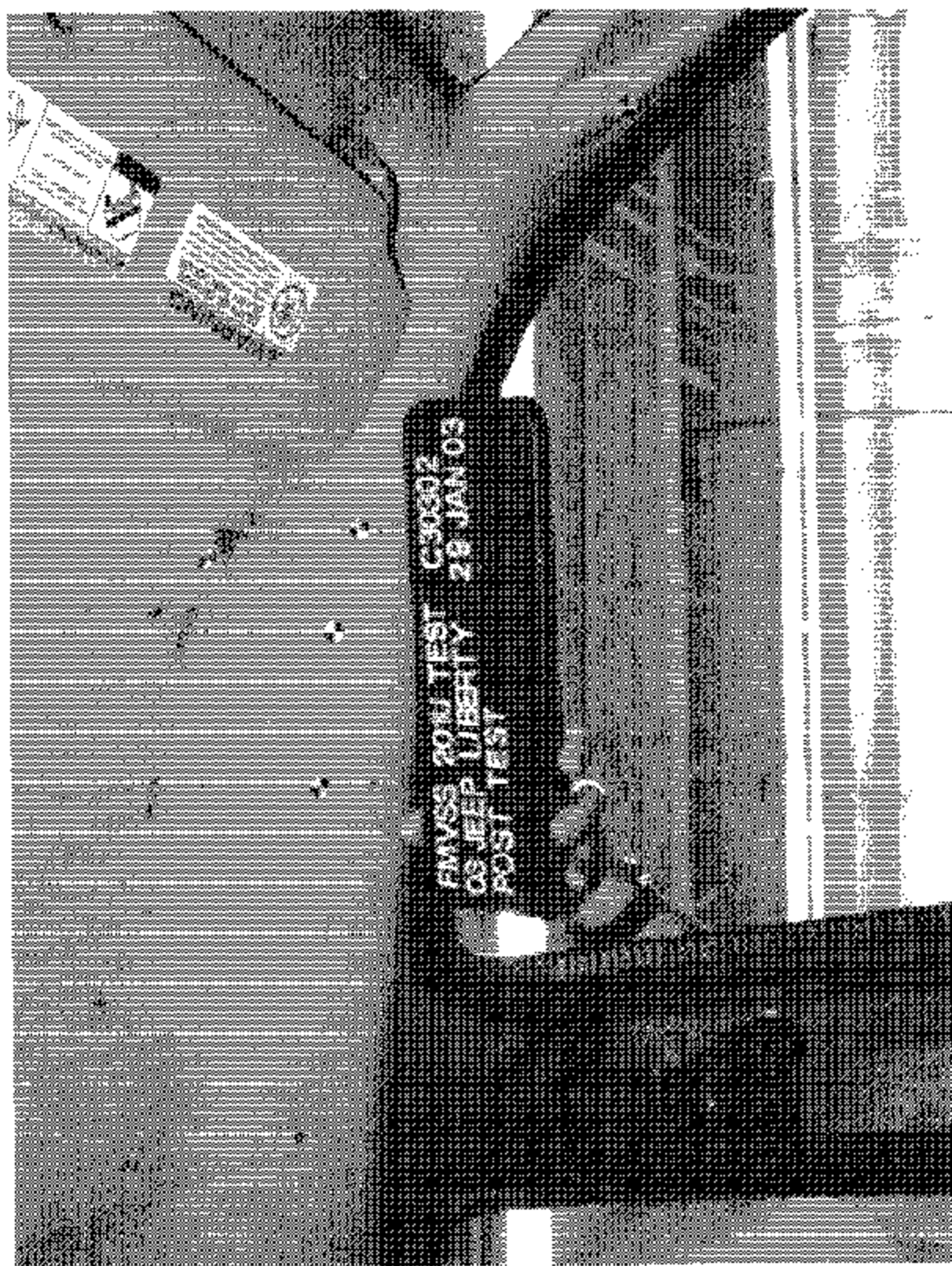


Figure 1: POST-TEST DRIVER SIDE SIDE RAIL

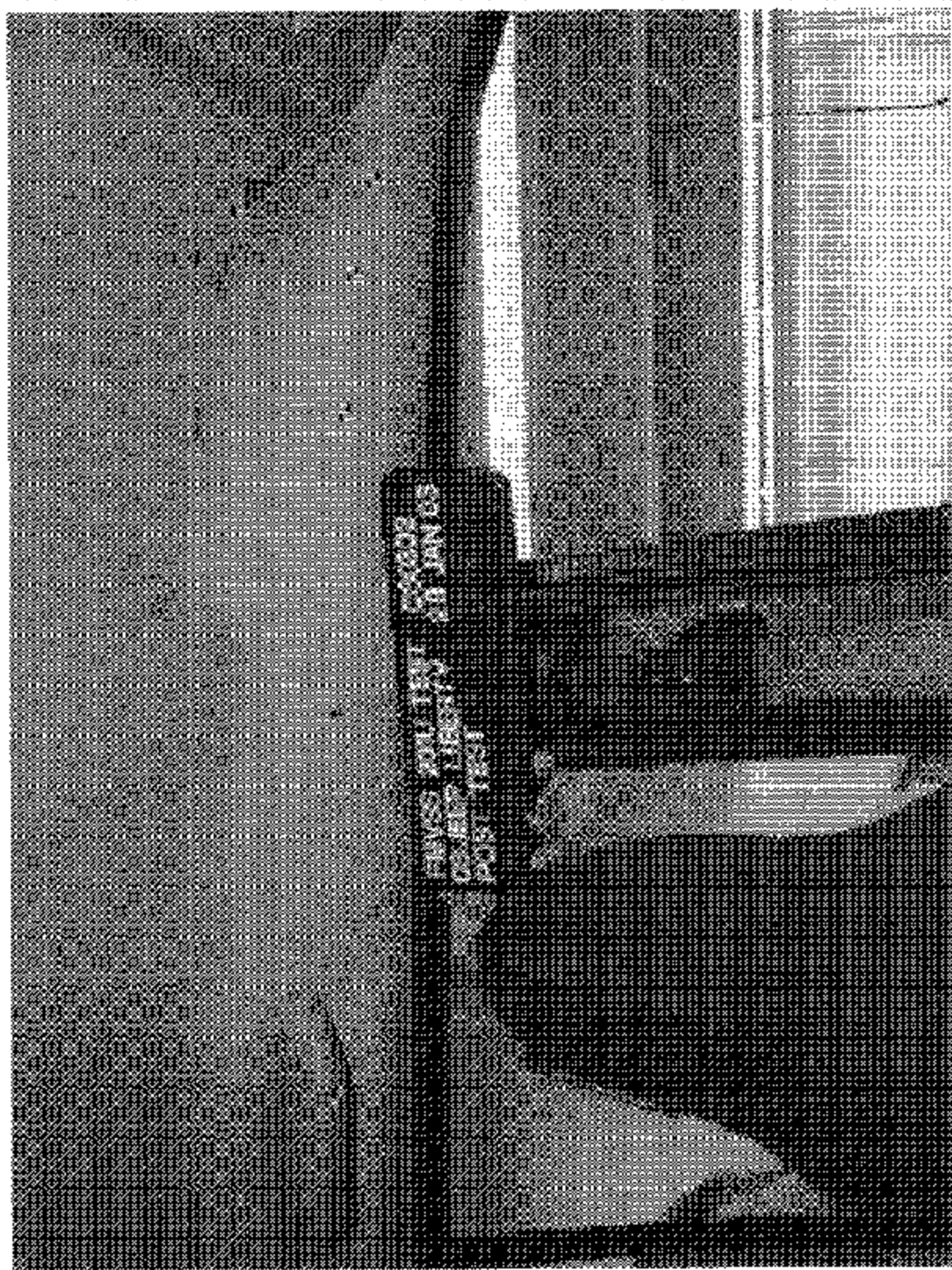


Figure : POST-TEST DRIVER SIDE B-PILLAR

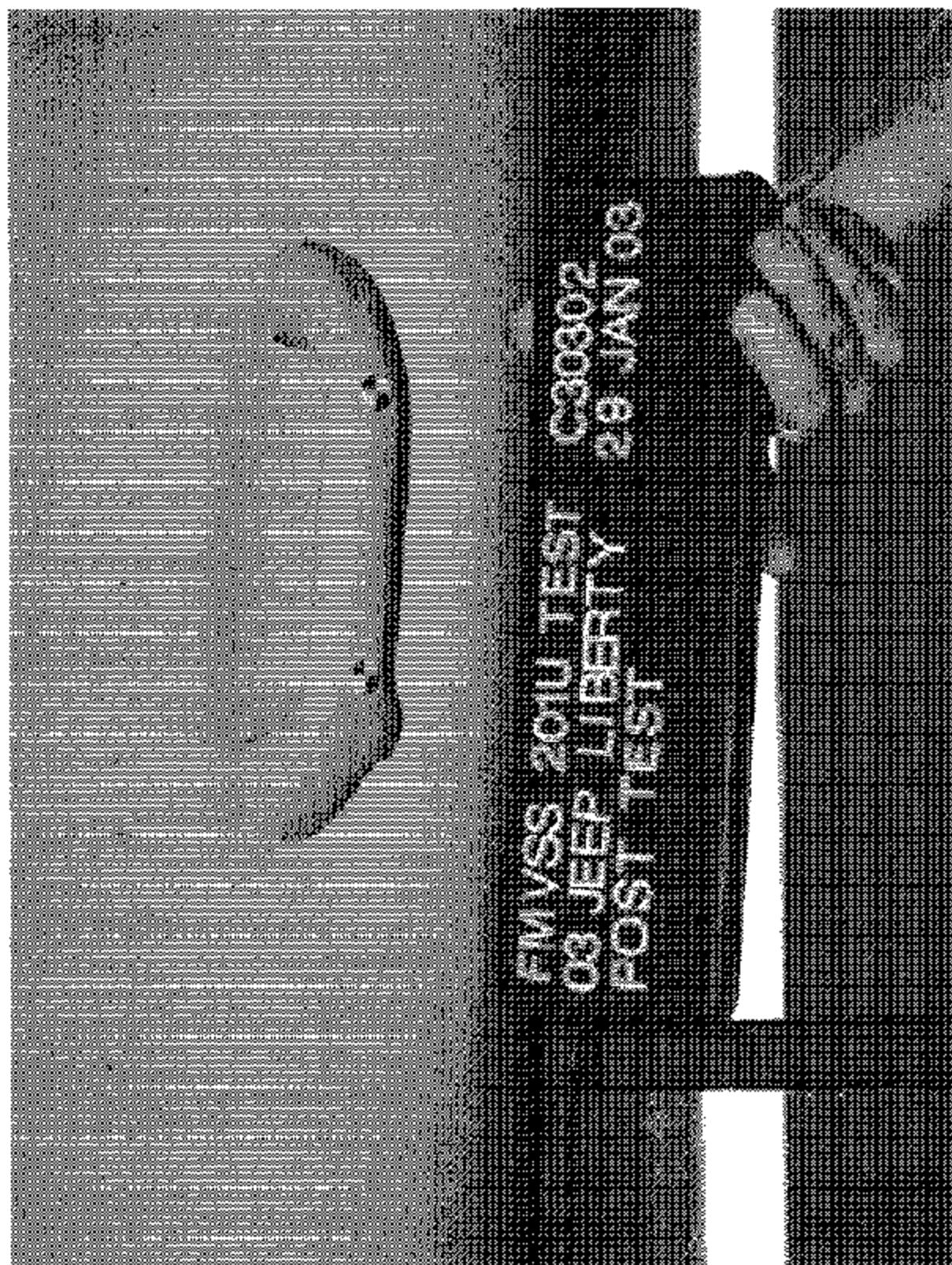


Figure 1. POST TEST DRIVER SIDE REAR GRAB HANDLE



Figure 1 POST-TEST DRIVER SIDE OTHER PILE UP

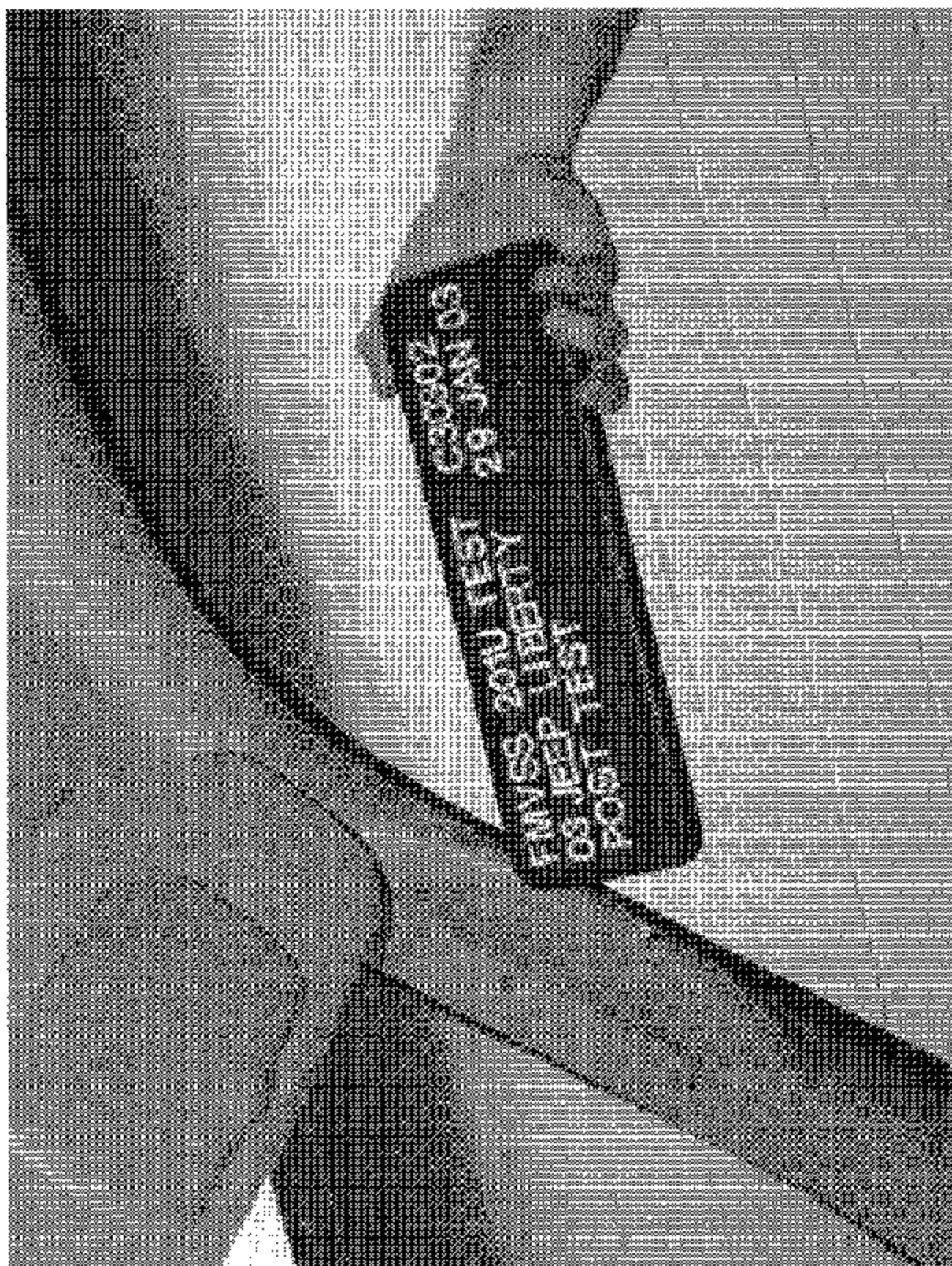


Figure : POST-TEST PASSENGER SIDE A-PILLAR

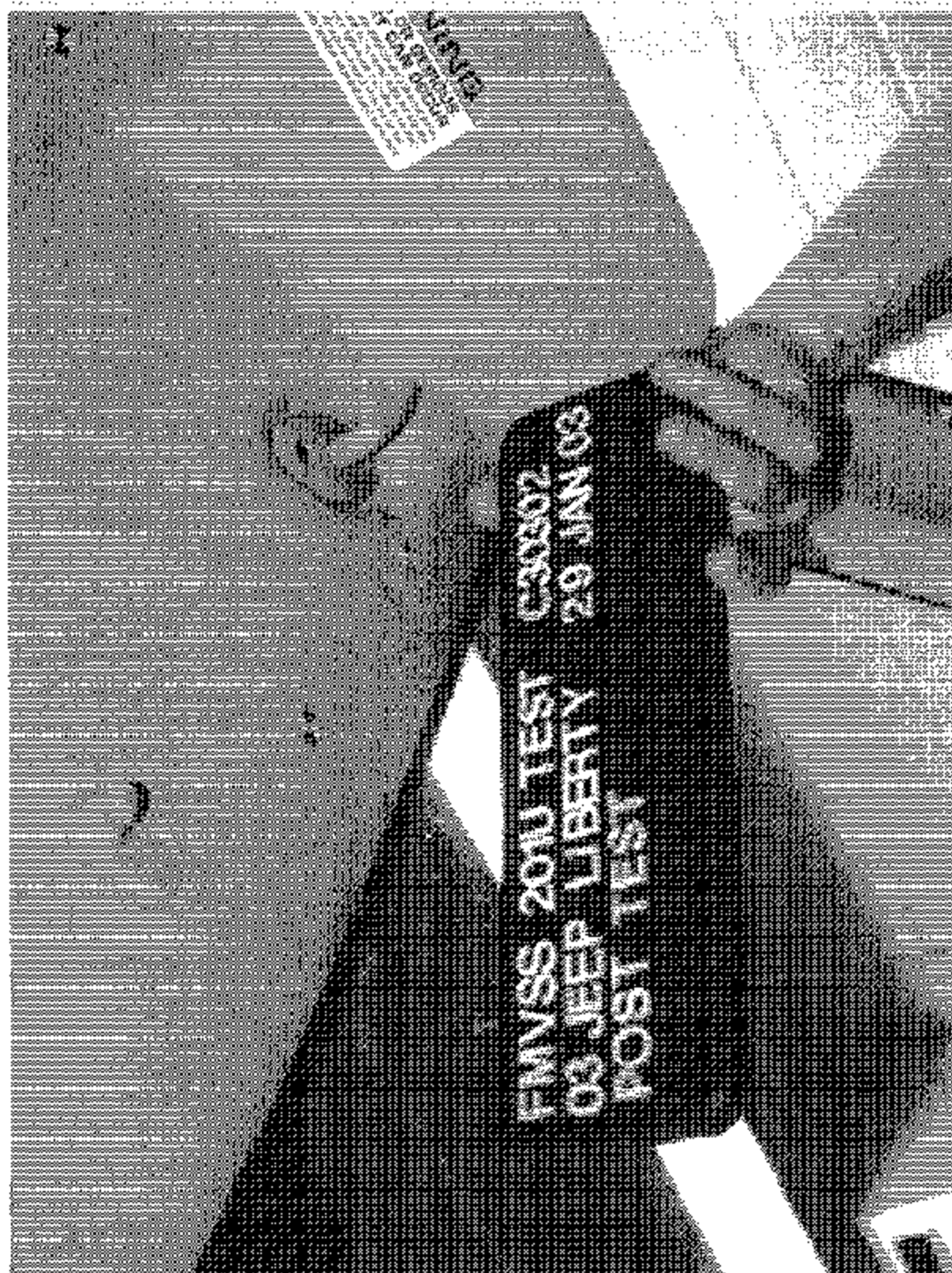


Figure POST-TEST PASSENGER SIDE FRONT READER

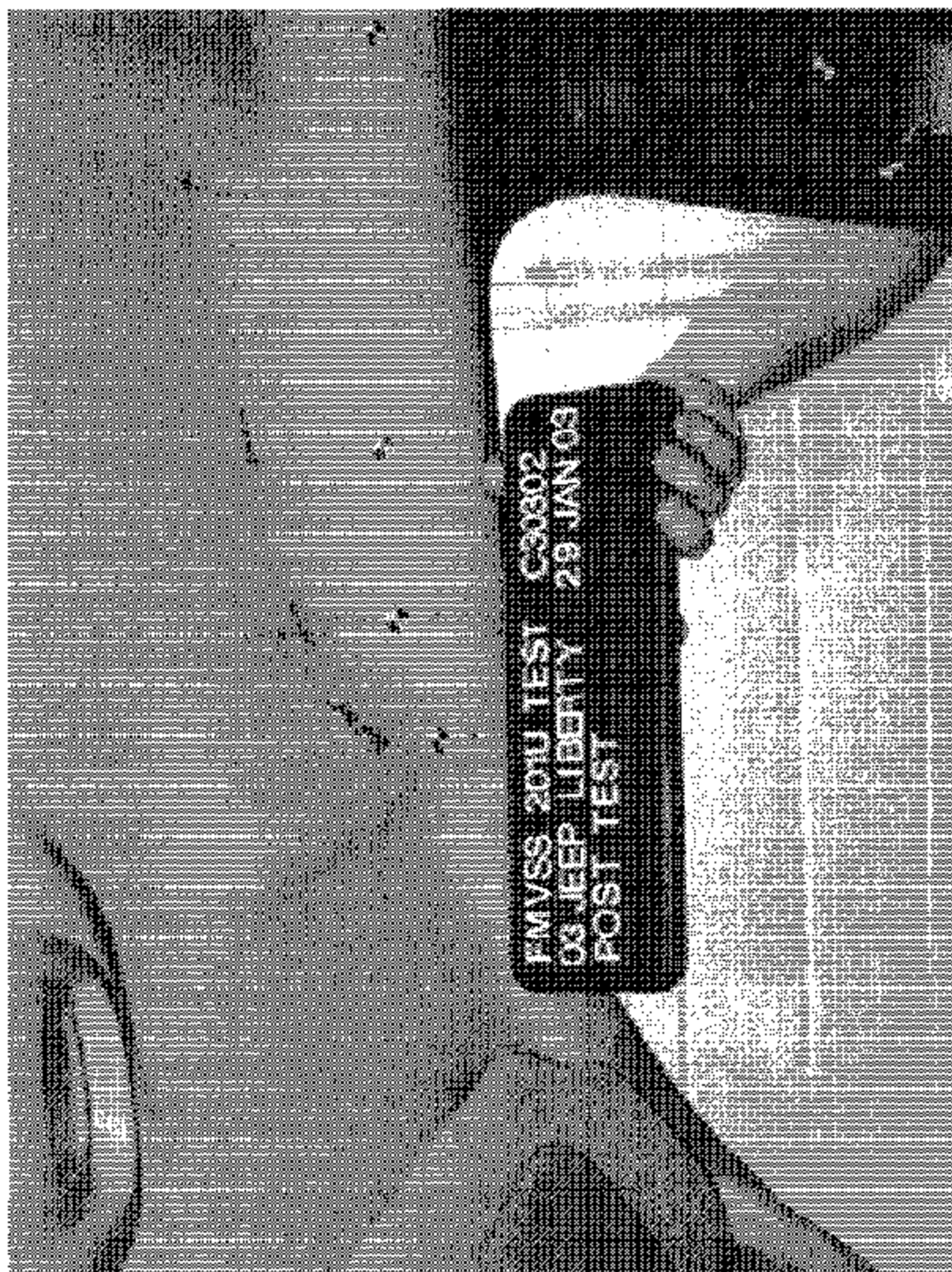


Figure - POST-TEST PASSENGER SIDE SIDE RAIL

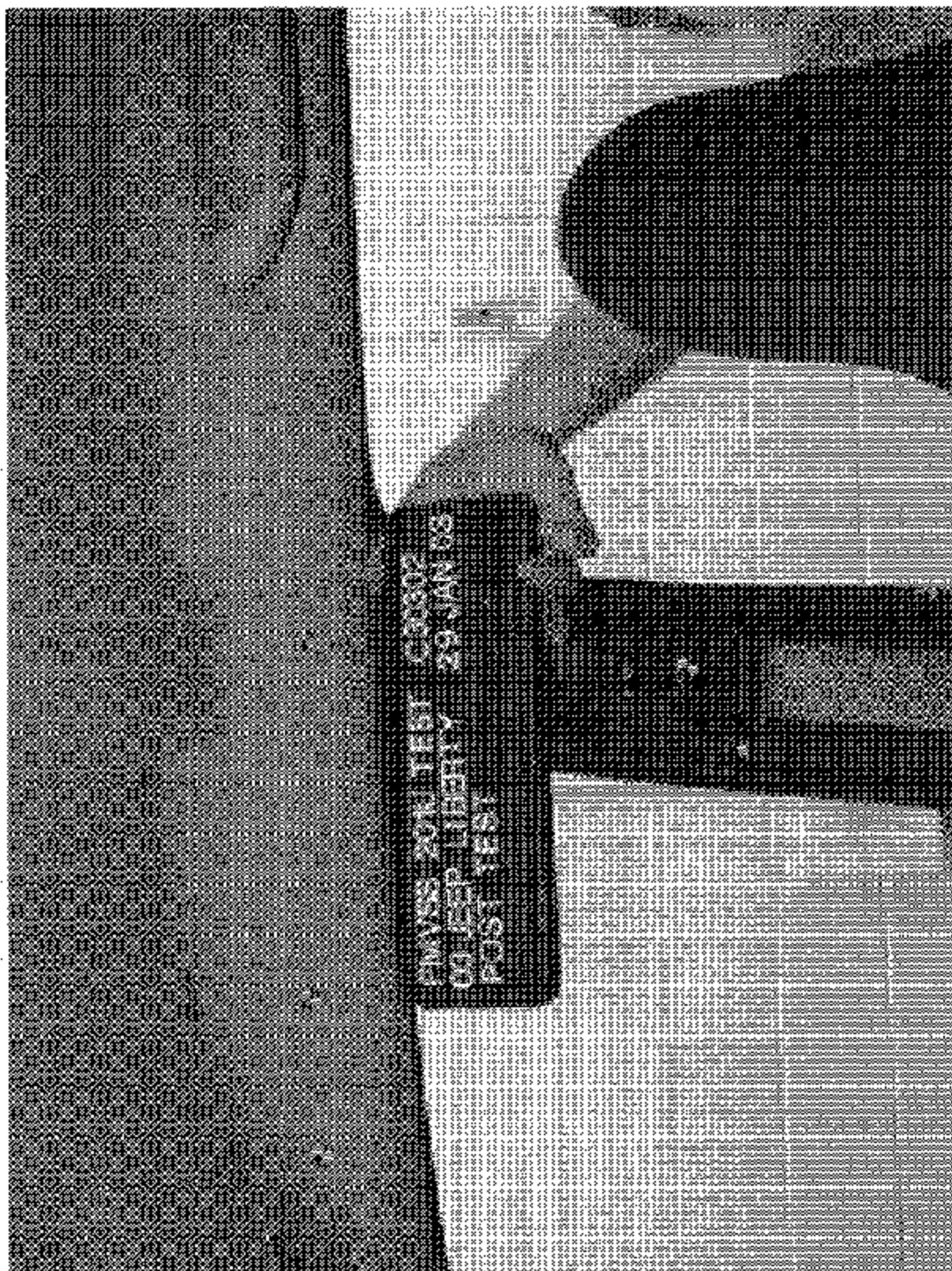


Figure : POST-TEST PASSENGER SIDE B-PILLAR

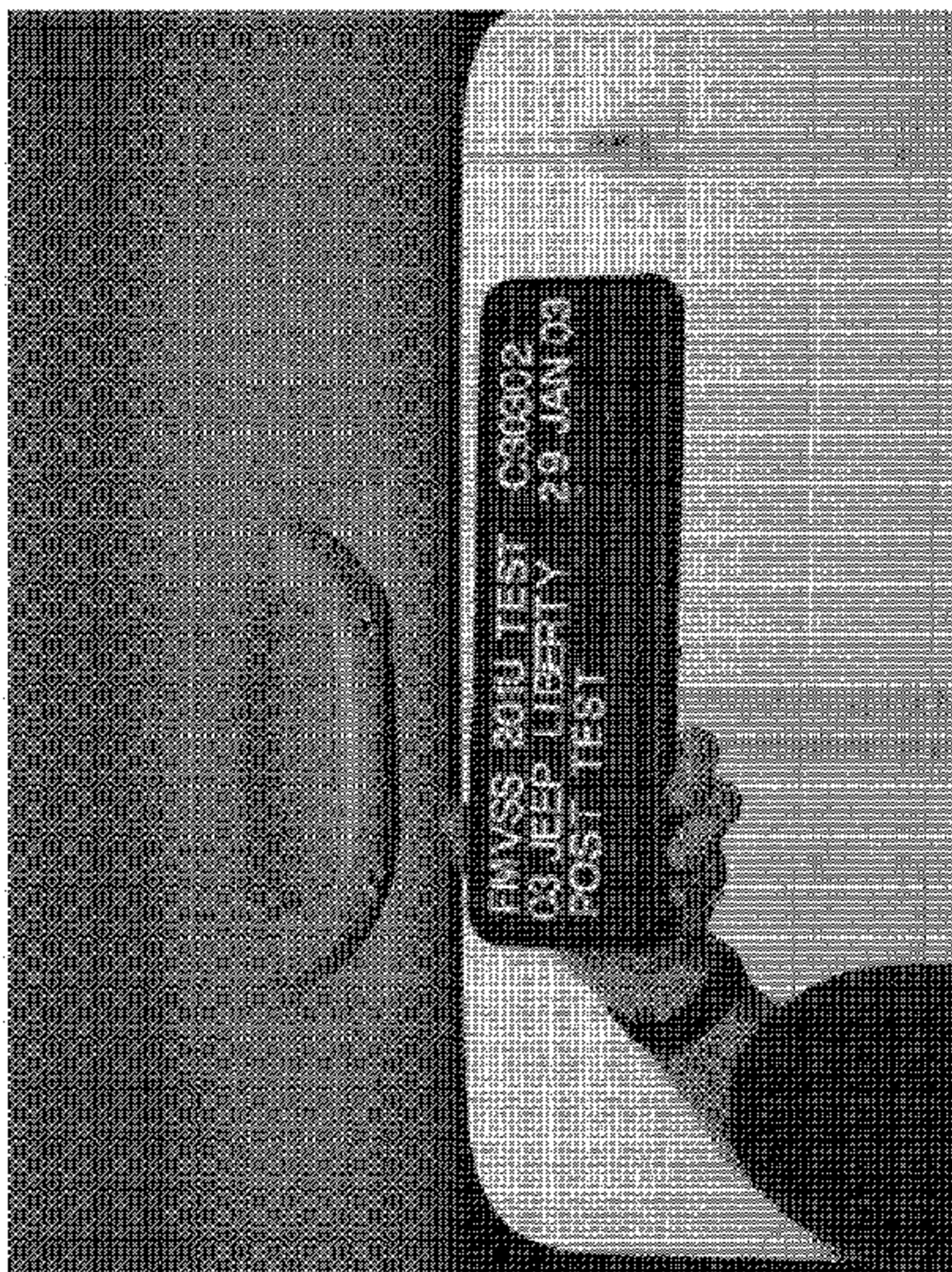


Figure 1. POST-TEST PASSENGER SIDE REAR GRAB HANDLE



Figure 1. POST-TEST PASSENGER SIDE OTHER PILLAR

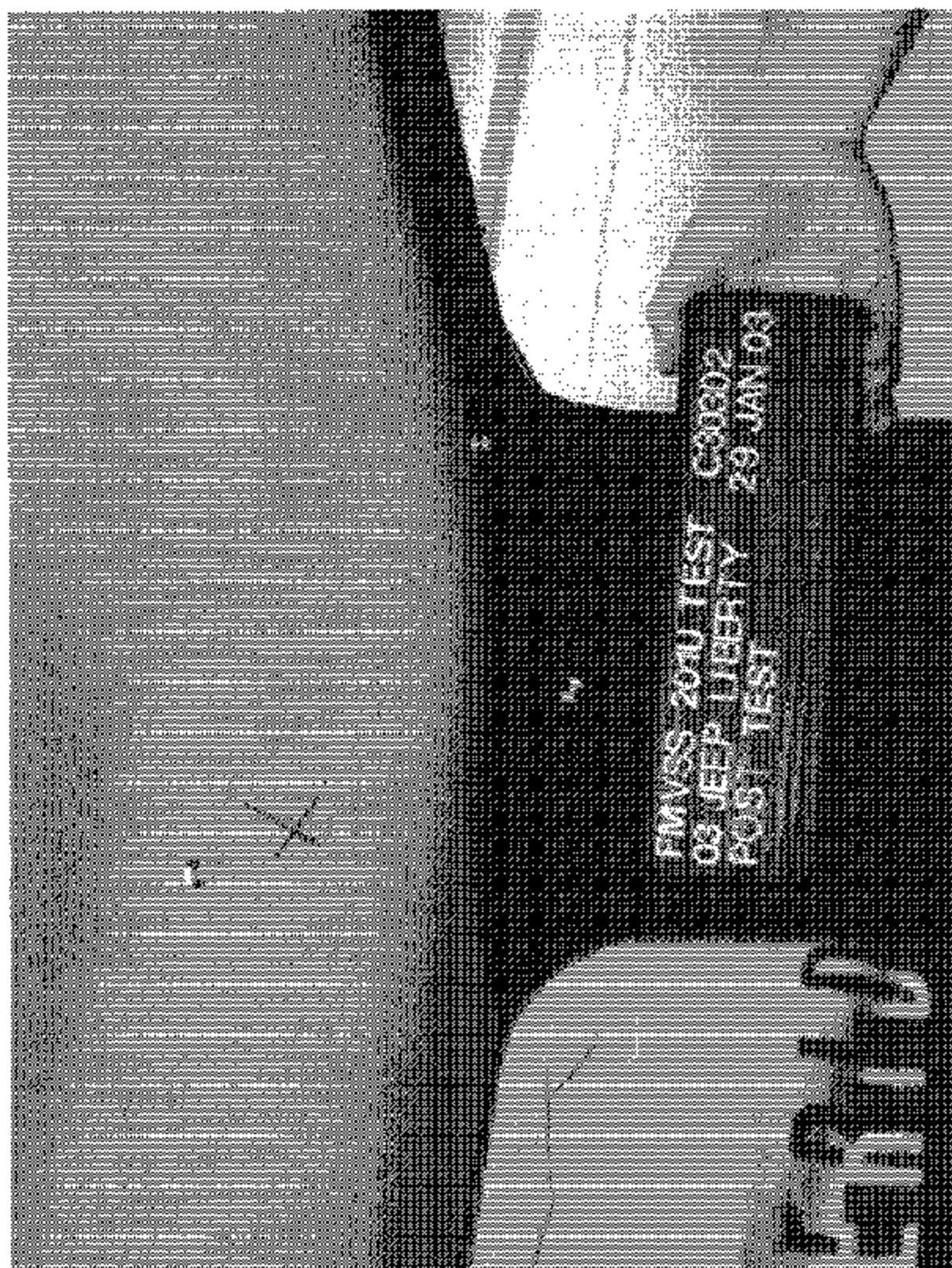


Figure 7. POST-TEST PASSENGER SIDE REAR PILLAR

APPENDIX B

PART 572L PERFORMANCE CALIBRATION IN SUPPORT OF VEHICLE SAFETY COMPLIANCE TESTING FOR OCCUPANT PROTECTION IN INTERIOR IMPACT

Appendix B contains the results from certification tests performed on the Free Motion Headforms utilized in this test program. The results indicate that the headforms meet all of the performance specifications given in 49 CFR Part 572 Subpart L.

The tests were conducted at the Dummy Certification Test Facility of Veridian Engineering. A summary of the test results are included in this Appendix.

PART 572L
HEAD DROP PRE-TEST

MANUFACTURER:	FIRST TECHNOLOGIES SAFETY SYSTEMS	
SERIAL NUMBER:	0642	
CALIBRATION DATE:	January 23, 2003	
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	19°C to 26°C	21
RELATIVE HUMIDITY	10% to 70%	19
PEAK RESULTANT ACCELERATION	225 Gs to 275 Gs	244.6
PEAK LATERAL ACCELERATION	15 Gs Maximum	1.9
IS ACCELERATION CURVE UNIMODAL?	YES	YES

HEAD ACCELEROMETER CALIBRATION INFORMATION

I.D. NUMBER	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	DATE OF LAST CALIBRATION	DATE OF NEXT CALIBRATION
1 - LONGITUDINAL	ENDEVCO	7264-2000T	J24876	9/02	3/03
2 - LATERAL	ENDEVCO	7264-2000T	J33030	9/02	3/03
3 - VERTICAL	ENDEVCO	7264-2000T	J31009	9/02	3/03

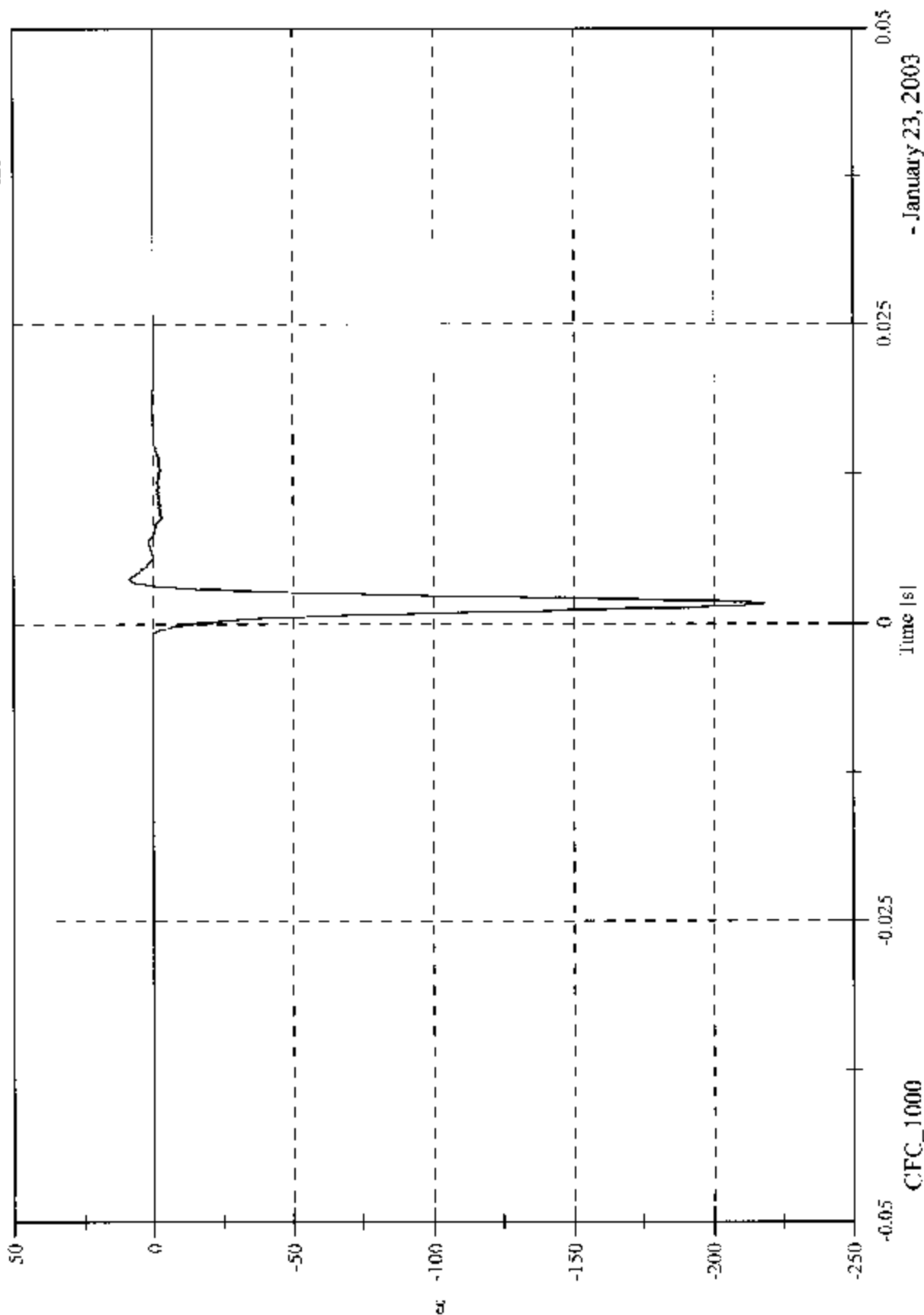
REMARKS:

1: MVSS 201U - Head Form Calibration Drops

Headform X Acceleration

Max: 8.7 [g] at 0.004 [s]

Min: -218.4 [g] at 0.002 [s]

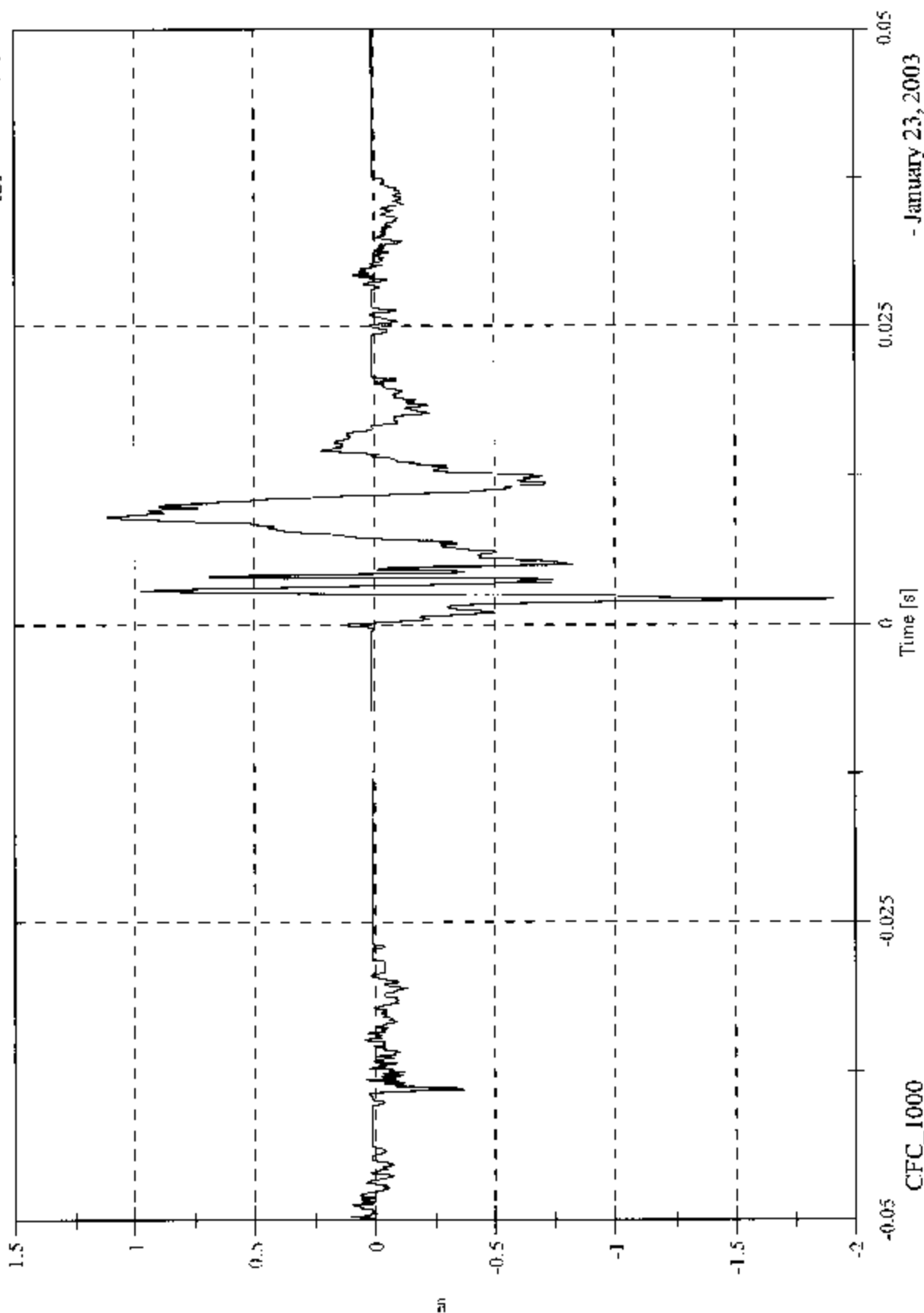


- January 23, 2003

FMVSS 2010 - II Head Form Calibration Drops

Max: 1.1 [g] at 0.009 [s]
Min: -1.9 [g] at 0.002 [s]

Headform Y Acceleration

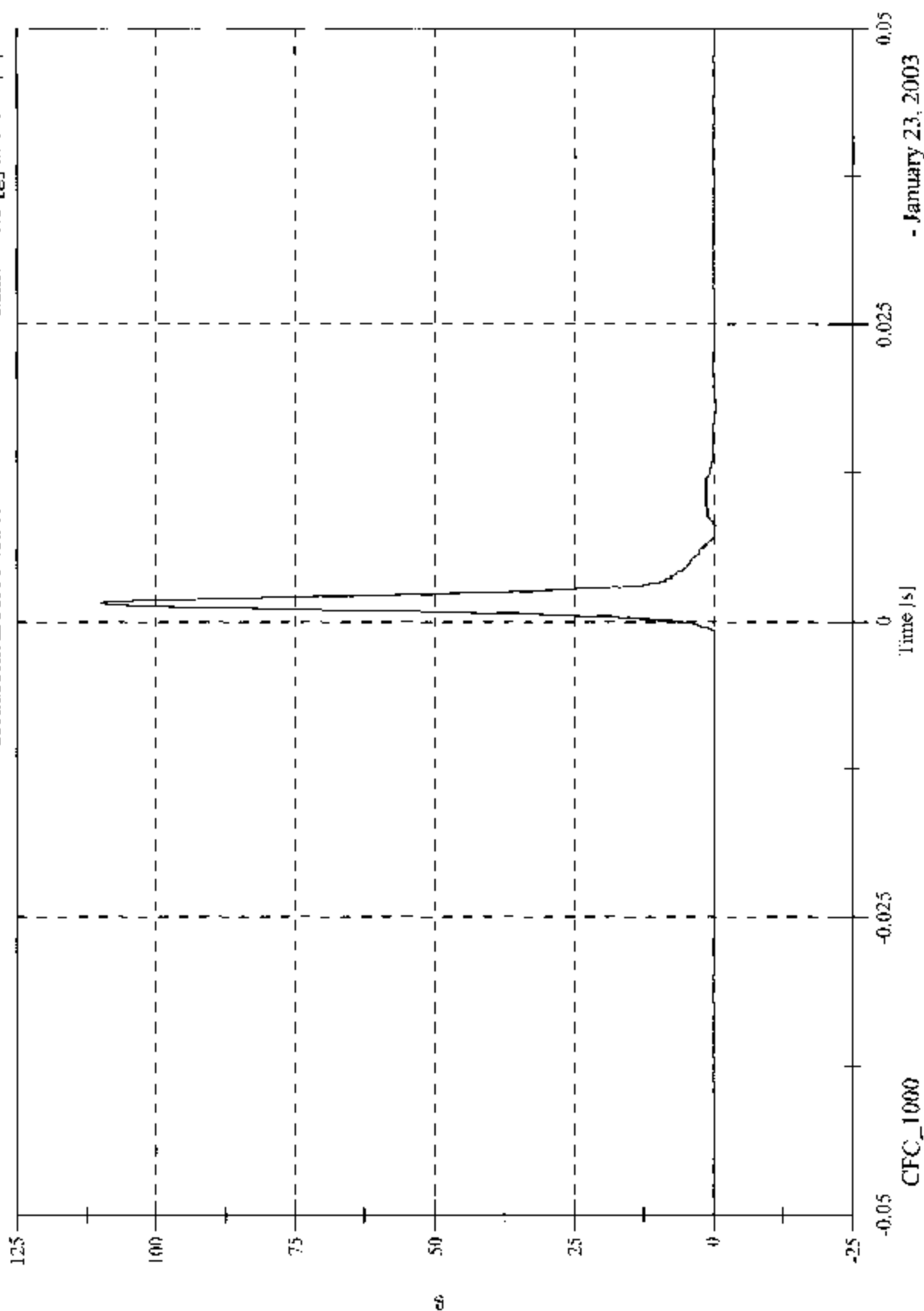


- January 23, 2003

FMVSS 2010 - Head Form Calibration Drops

Headform Z Acceleration

Max: 110.2 [g] at 0.002 [s]
Min: -0.3 [g] at 0.018 [s]

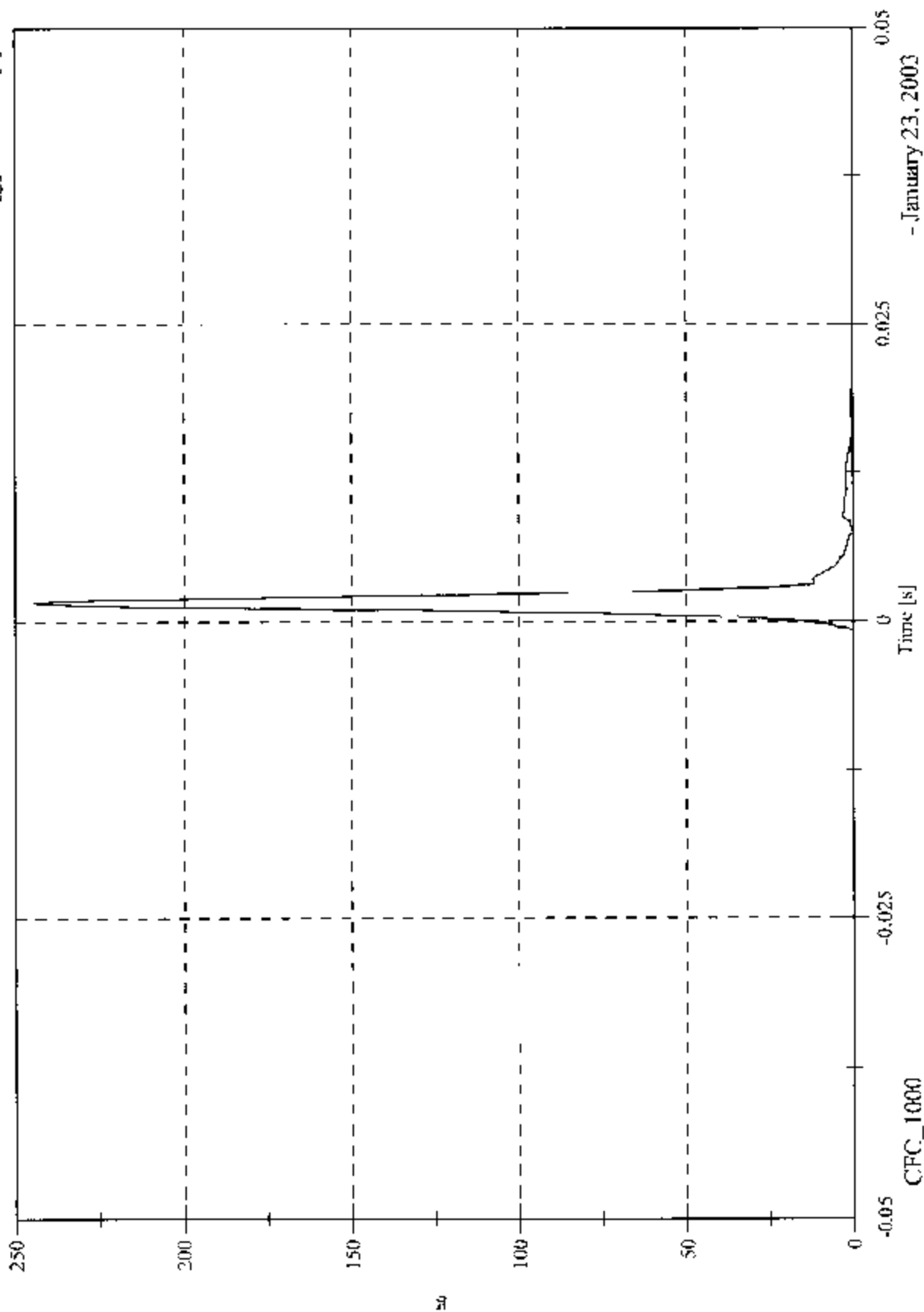


- January 23, 2003

FMVSS 201U - Head Form Calibration Drops

Max: 244.6 [g] at 0.002 [s]
Min: 0.0 [g] at -0.030 [s]

Headform Resultant



PART 572L
HEAD DROP PRE-TEST

MANUFACTURER:	FIRST TECHNOLOGIES SAFETY SYSTEMS	
SERIAL NUMBER:	805	
CALIBRATION DATE:	January 23, 2003	
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	19°C to 26°C	21
RELATIVE HUMIDITY	10% to 70%	19
PEAK RESULTANT ACCELERATION	225 Gs to 275 Gs	230.5
PEAK LATERAL ACCELERATION	15 Gs Maximum	3.6
IS ACCELERATION CURVE UNIMODAL?	YES	YES

HEAD ACCELEROMETER CALIBRATION INFORMATION

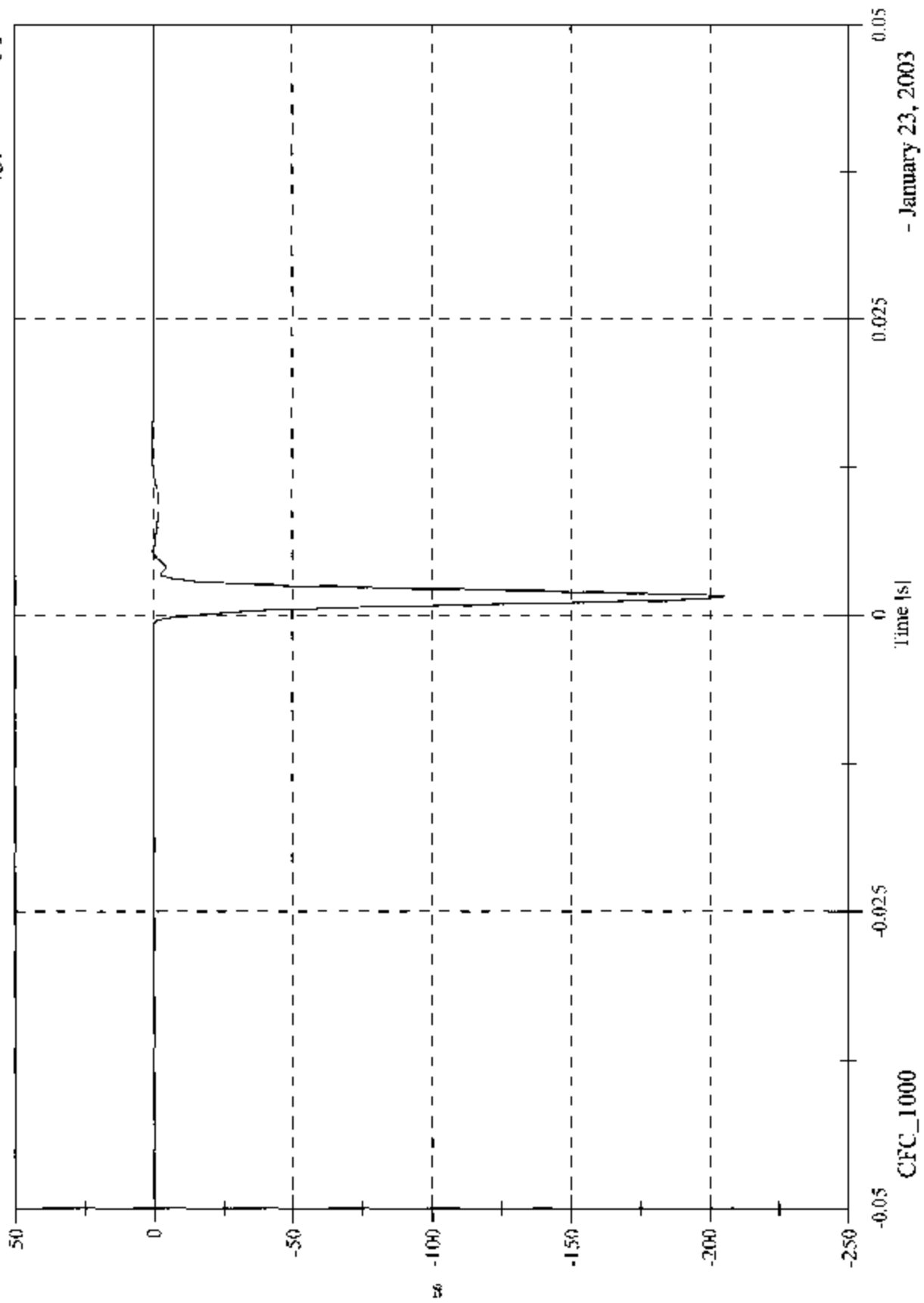
I.D. NUMBER	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	DATE OF LAST CALIBRATION	DATE OF NEXT CALIBRATION
1 - LONGITUDINAL	ENDEVCO	7264-2000T	J38127	9/02	3/03
2 - LATERAL	ENDEVCO	7264-2000T	J37980	9/02	3/03
3 - VERTICAL	ENDEVCO	7264-2000T	J37854	9/02	3/03

REMARKS:

FMVSS 201U - Head Form Calibration Drops

Max: 0.5 [g] at 0.005 [s]
Min: -204.8 [g] at 0.001 [s]

Headform X Acceleration

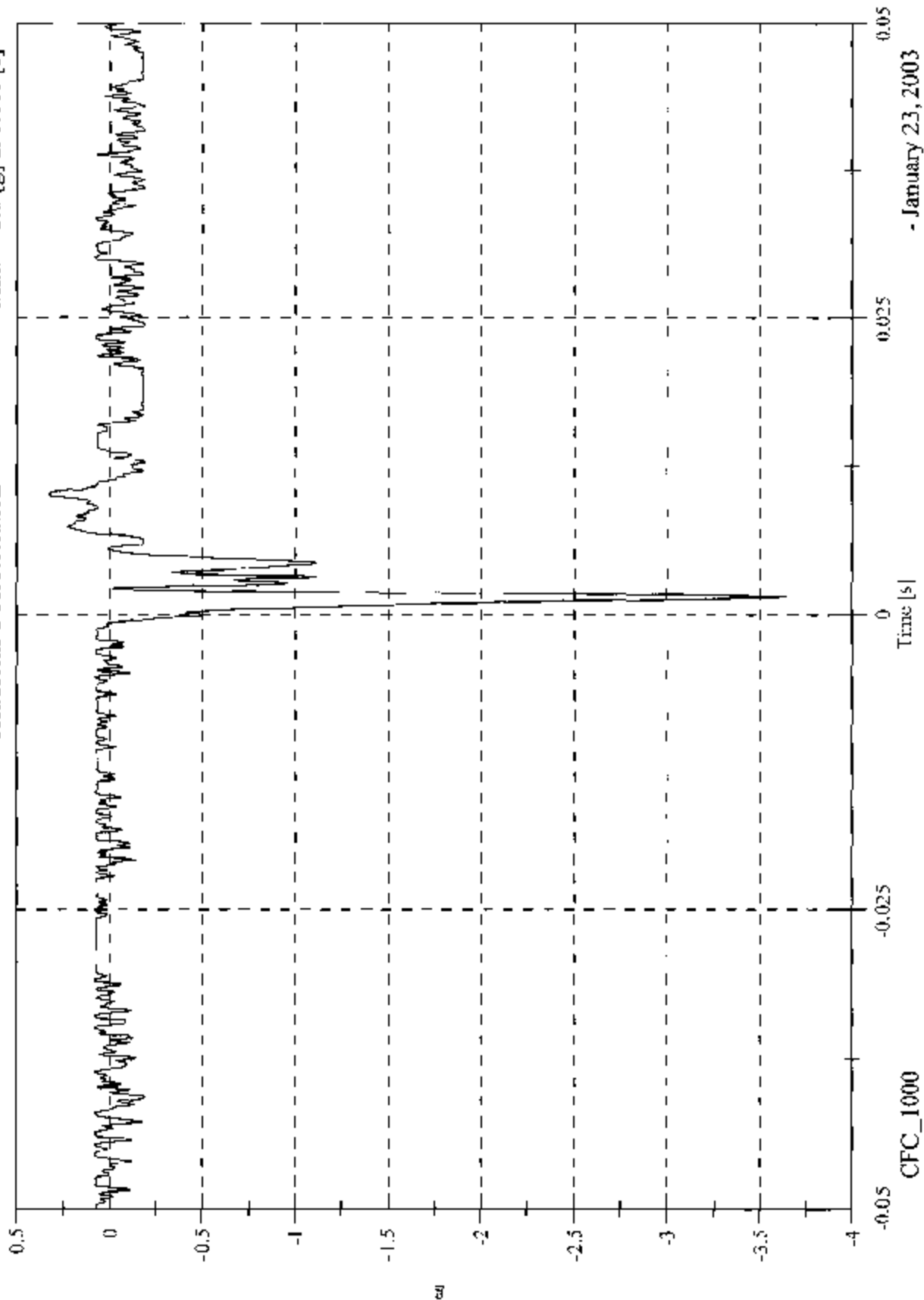


- January 23, 2003

FMVSS 2010 - Head Form Calibration Drops

Max: 0.3 [g] at 0.010 [s]
Min: -3.6 [g] at 0.001 [s]

Headform Y Acceleration



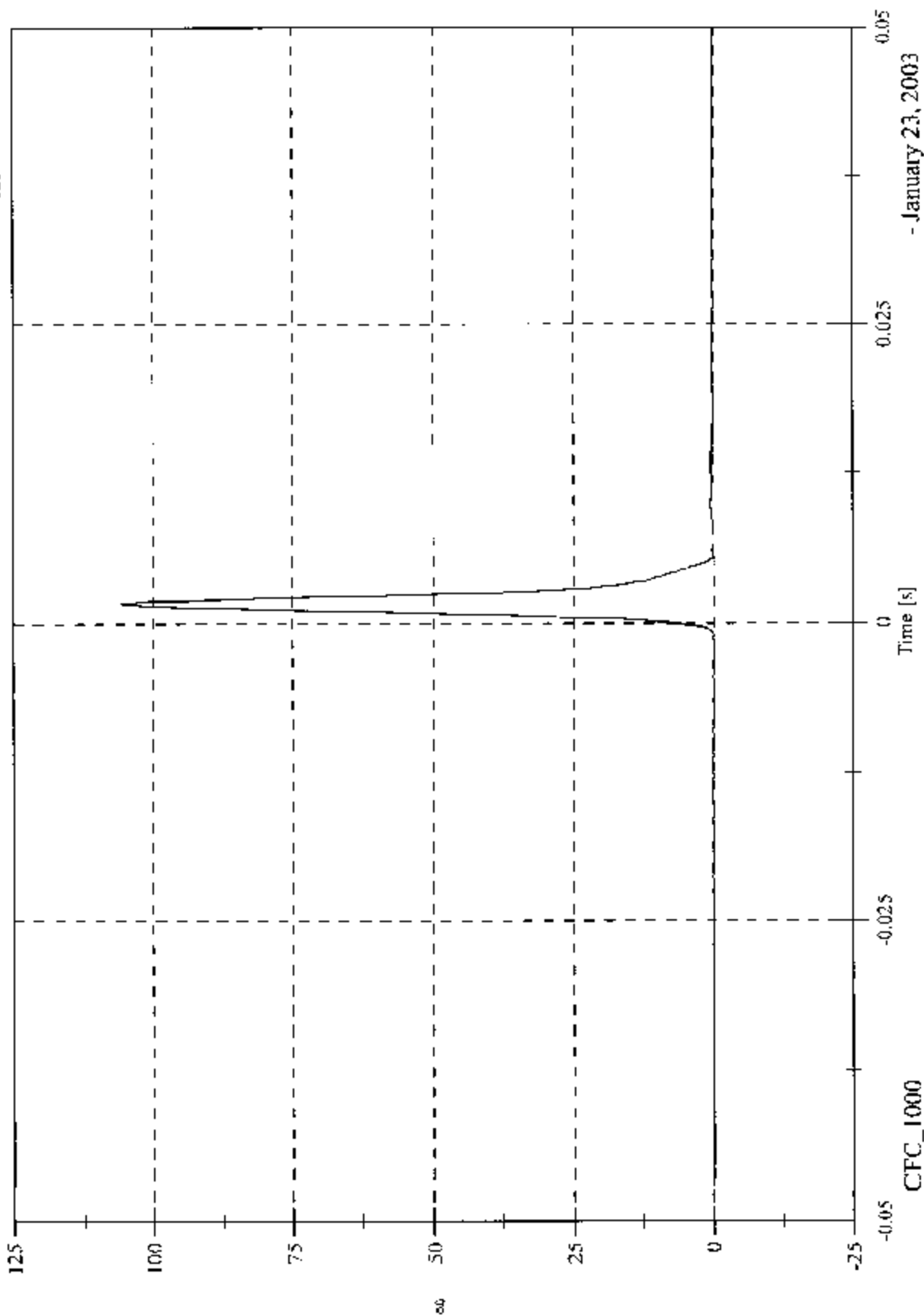
- January 23, 2003

FMVSS 201U - Head Form Calibration Drops

I Headform Z Acceleration

Max: 106.0 [g] at 0.002 [s]

Min: -0.1 [g] at 0.007 [s]

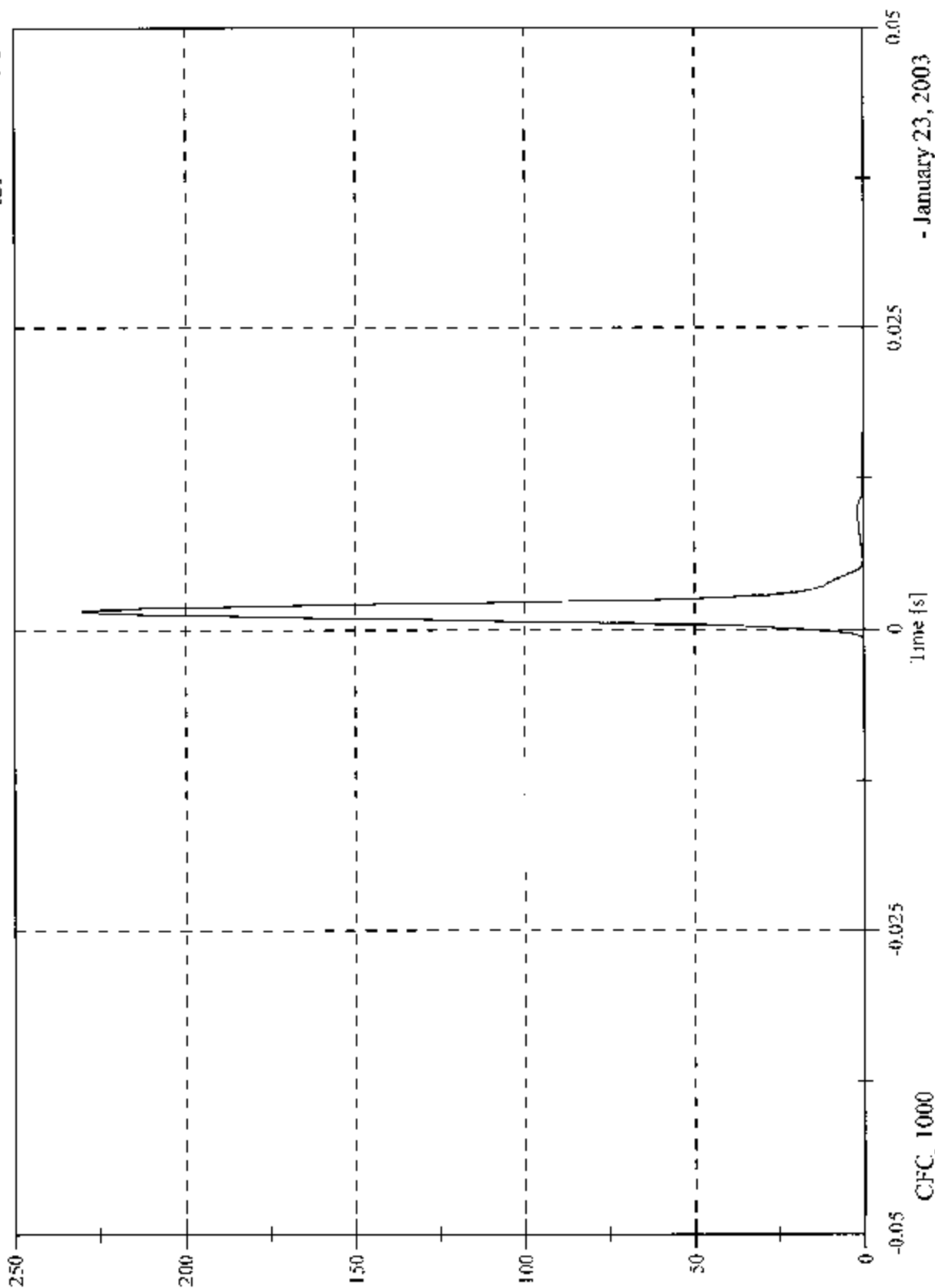


- January 23, 2003

FMVSS 201U - Head Form Calibration Drops

Max: 230.5 [g] at 0.001 [s]
Min: 0.0 [g] at -0.046 [s]

Headform Resultant



**PART 572L
HEAD DROP PRE-TEST**

MANUFACTURER:	APPLIED SAFETY TECHNOLOGIES CORPORATION	
SERIAL NUMBER:	0062	
CALIBRATION DATE:	January 23, 2003	
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	19°C to 26°C	21
RELATIVE HUMIDITY	10% to 70%	19
PEAK RESULTANT ACCELERATION	225 Gs to 275 Gs	231.9
PEAK LATERAL ACCELERATION	15 Gs Maximum	9.8
IS ACCELERATION CURVE UNIMODAL?	YES	YES

HEAD ACCELEROMETER CALIBRATION INFORMATION

I.D. NUMBER	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	DATE OF LAST CALIBRATION	DATE OF NEXT CALIBRATION
1 - LONGITUDINAL	ENDEVCO	7264-2000T	J33127	9/02	3/03
2 - LATERAL	ENDEVCO	7264-2000T	J33019	9/02	3/03
3 - VERTICAL	ENDEVCO	7264-2000T	J32782	9/02	3/03

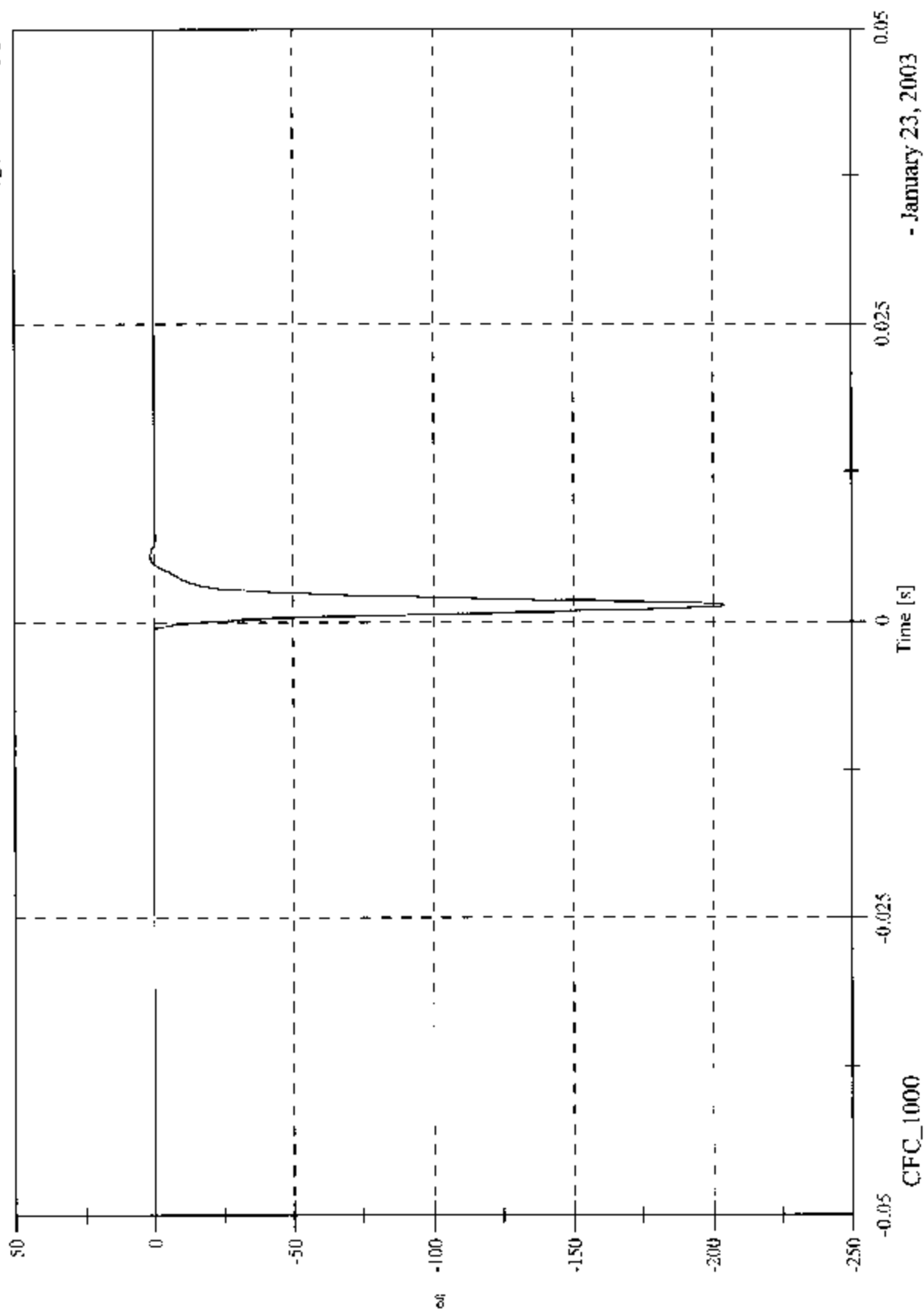
REMARKS:

FMVSS 201U - Head Form Calibration Drops

Max: 1.5 [g] at 0.005 [s]

Min: -204.3 [g] at 0.001 [s]

Headform X Acceleration

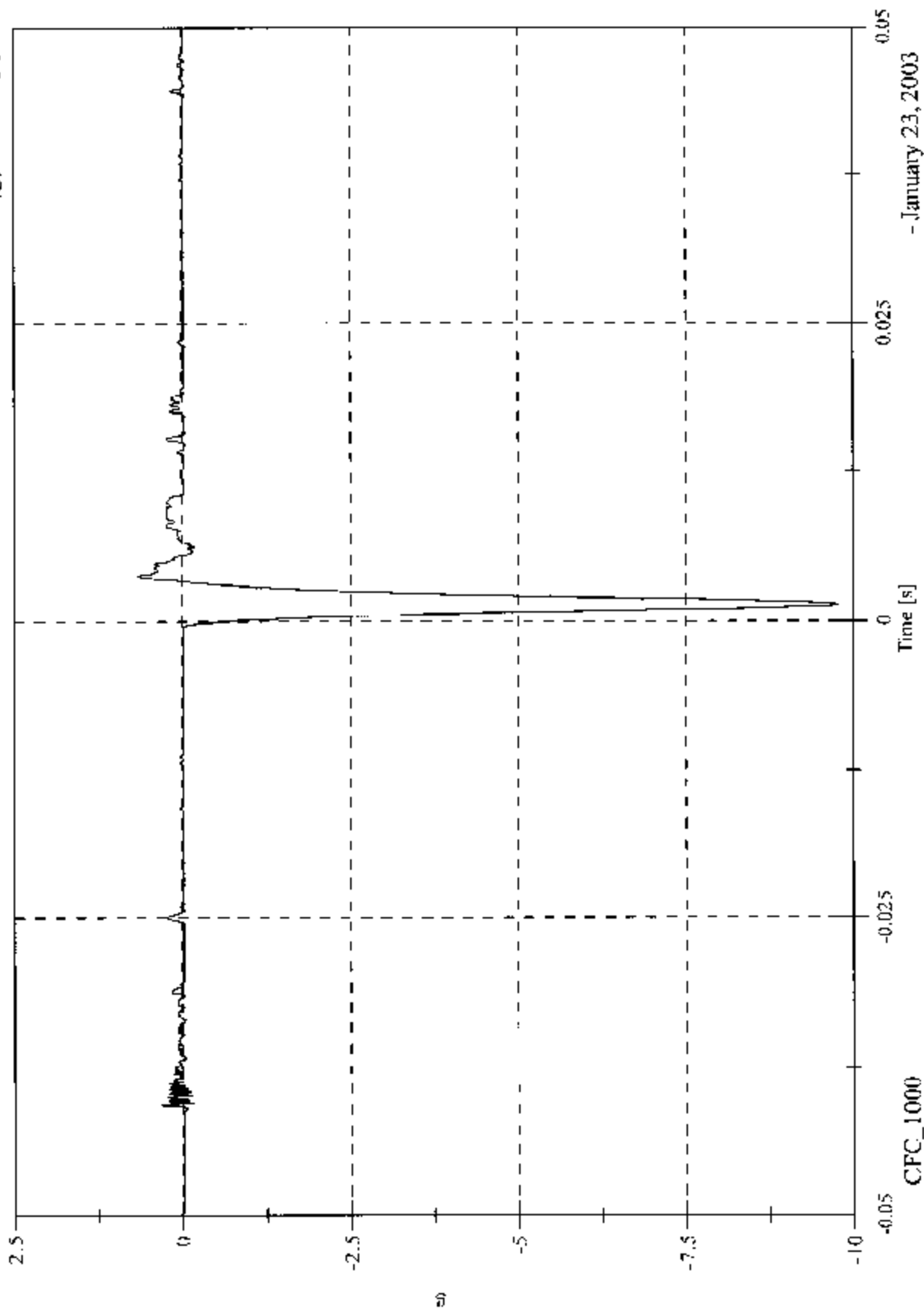


- January 23, 2003

FMVSS 2010 - Head Form Calibration Drops

Headform Y Acceleration

Max: 0.7 [g] at 0.004 [s]
Min: -9.8 [g] at 0.001 [s]



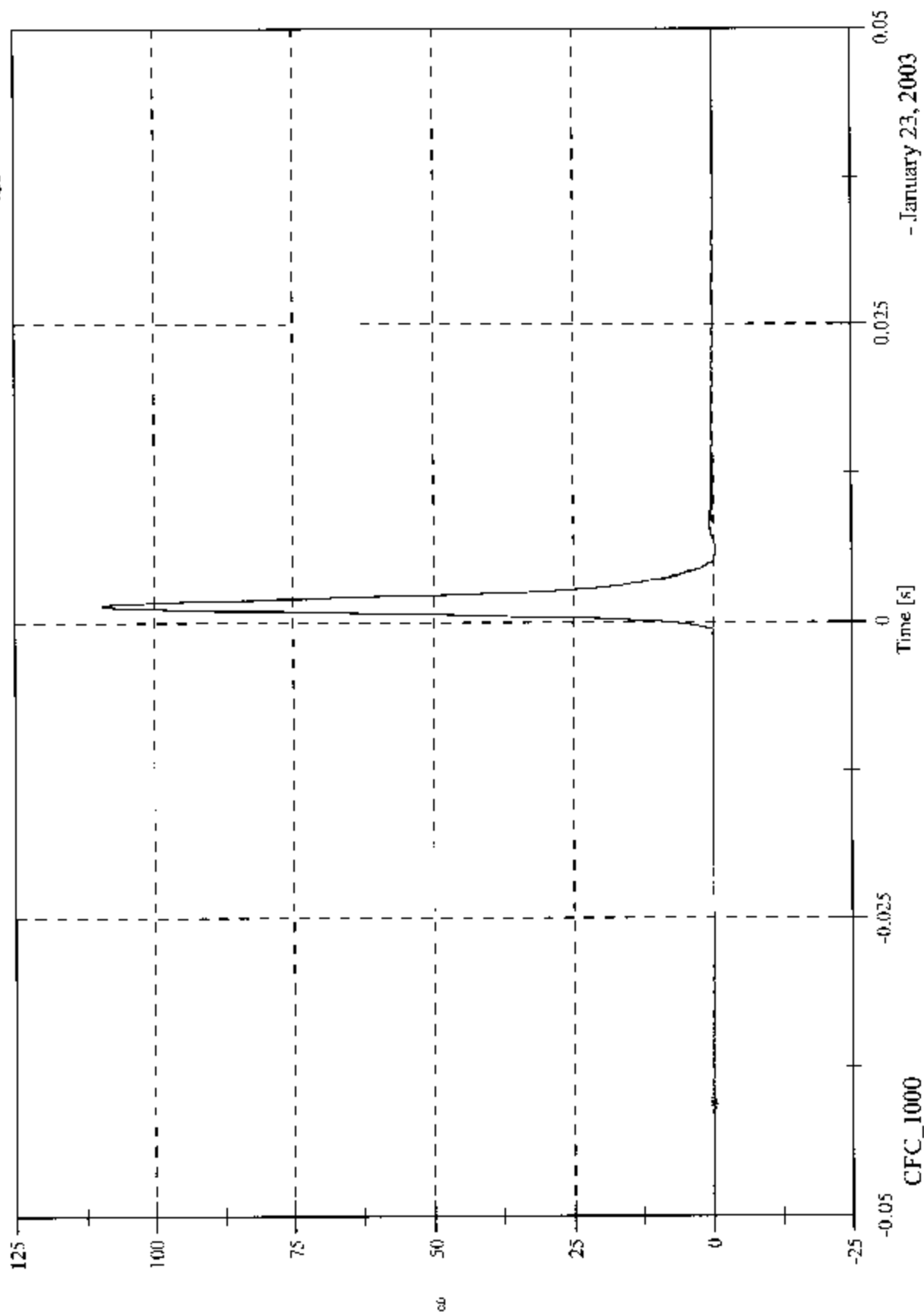
- January 23, 2003

FMVSS 201U - Head Form Calibration Drops

Max: 109.3 [g] at 0.001 [s]

Min: -0.6 [g] at 0.006 [s]

Headform Z Acceleration

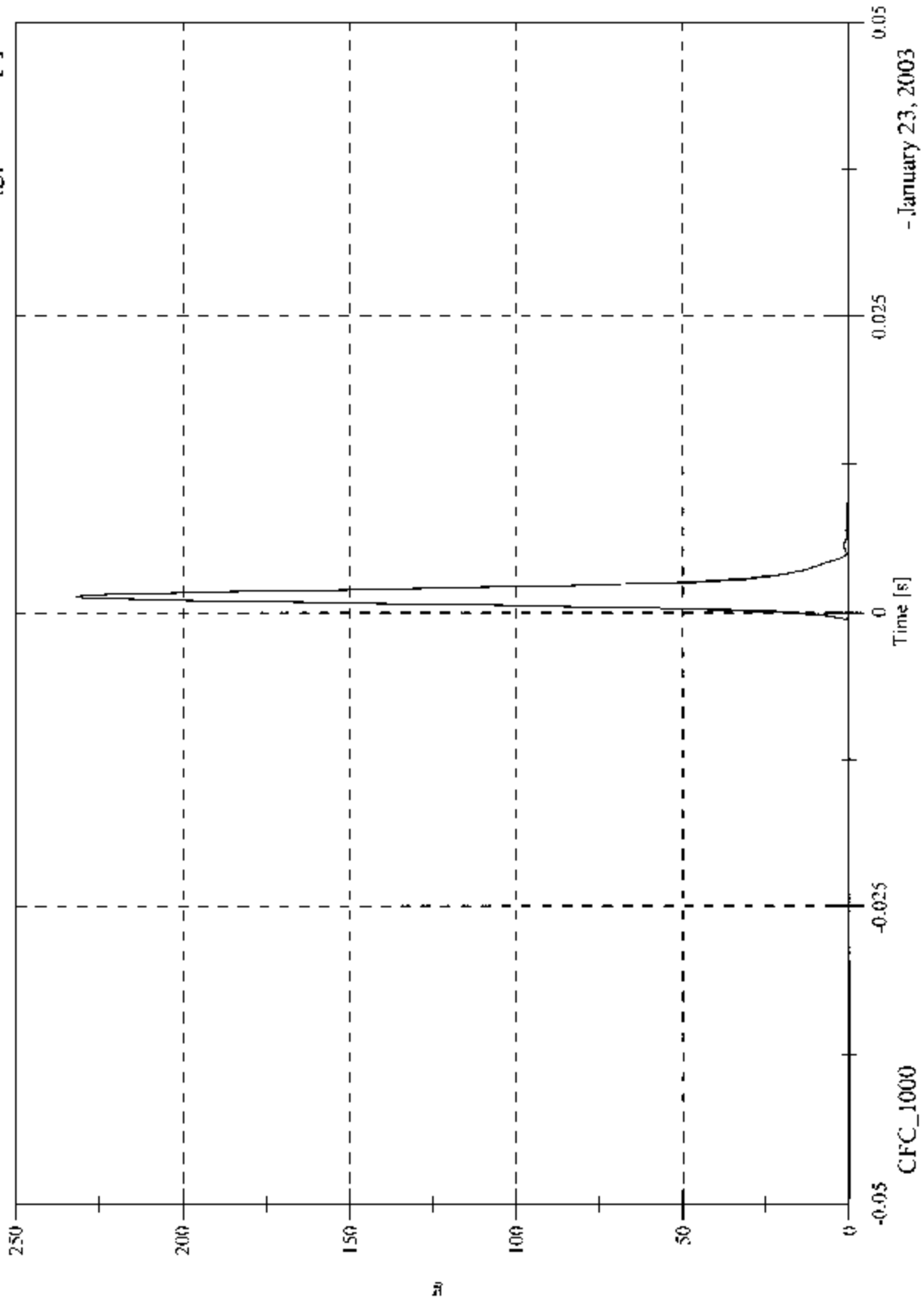


- January 23, 2003

FMVSS 201U - Head Form Calibration Drops

Max: 231.9 [g] at 0.001 [s]
Min: 0.0 [g] at 0.038 [s]

Headform Resultant



- January 23, 2003

**PART 572L
HEAD DROP PRE-TEST**

MANUFACTURER:	APPLIED SAFETY TECHNOLOGIES CORPORATION	
SERIAL NUMBER:	0355	
CALIBRATION DATE:	January 23, 2003	
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	19°C to 26°C	21
RELATIVE HUMIDITY	10% to 70%	19
PEAK RESULTANT ACCELERATION	225 Gs to 275 Gs	233.4
PEAK LATERAL ACCELERATION	15 Gs Maximum	2.8
IS ACCELERATION CURVE UNIMODAL?	YES	YES

HEAD ACCELEROMETER CALIBRATION INFORMATION

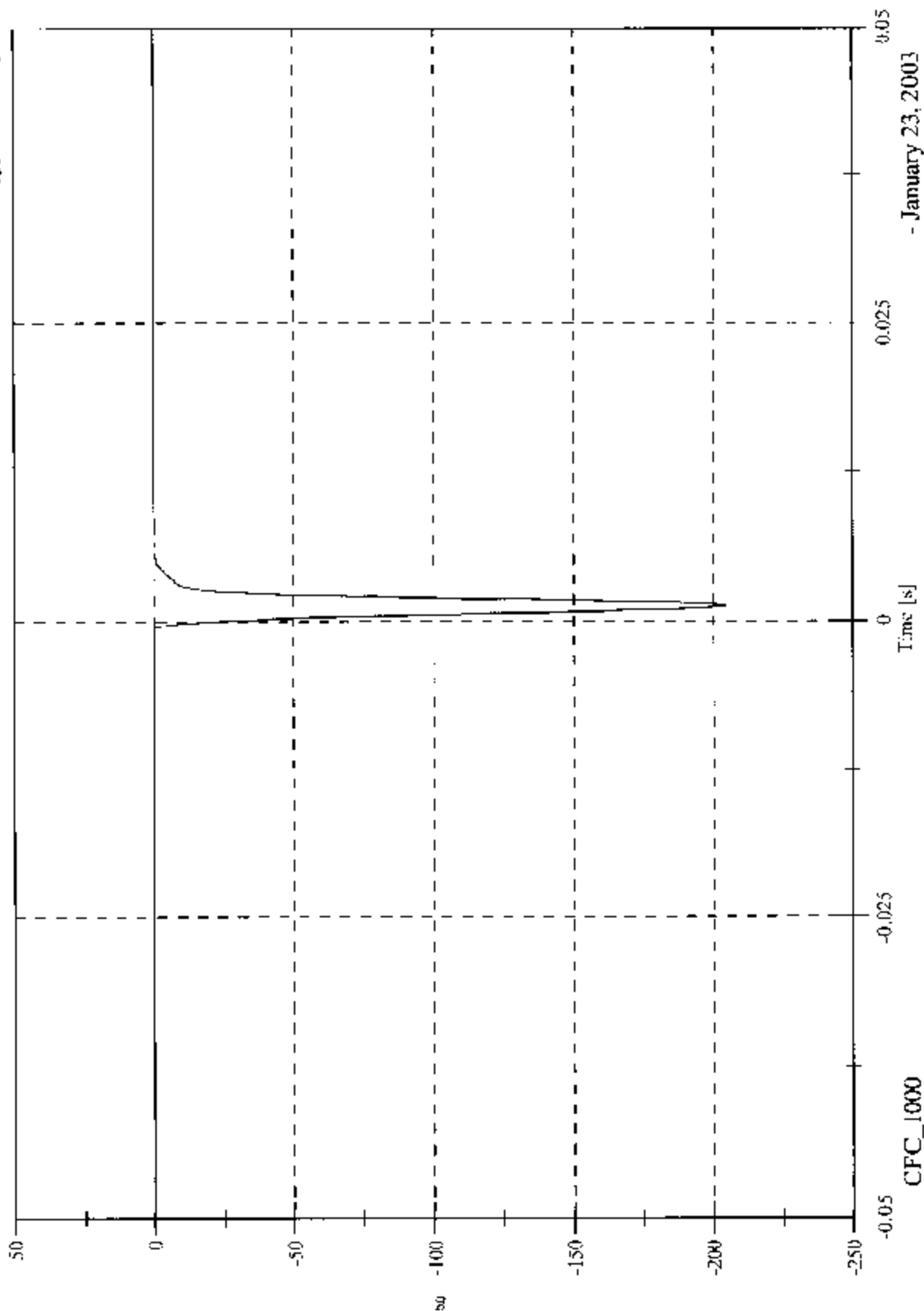
ID. NUMBER	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	DATE OF LAST CALIBRATION	DATE OF NEXT CALIBRATION
1 - LONGITUDINAL	ENDEVCO	7264-2000T	J28671	9/02	3/03
2 - LATERAL	ENDEVCO	7264-2000T	J32779	9/02	3/03
3 - VERTICAL	ENDEVCO	7264-2000T	J25854	9/02	3/03

REMARKS:

FMVSS 201U - Head Form Calibration Drops

Headform X Acceleration

Max: 0.3 [g] at 0.010 [s]
Min: -204.3 [g] at 0.001 [s]

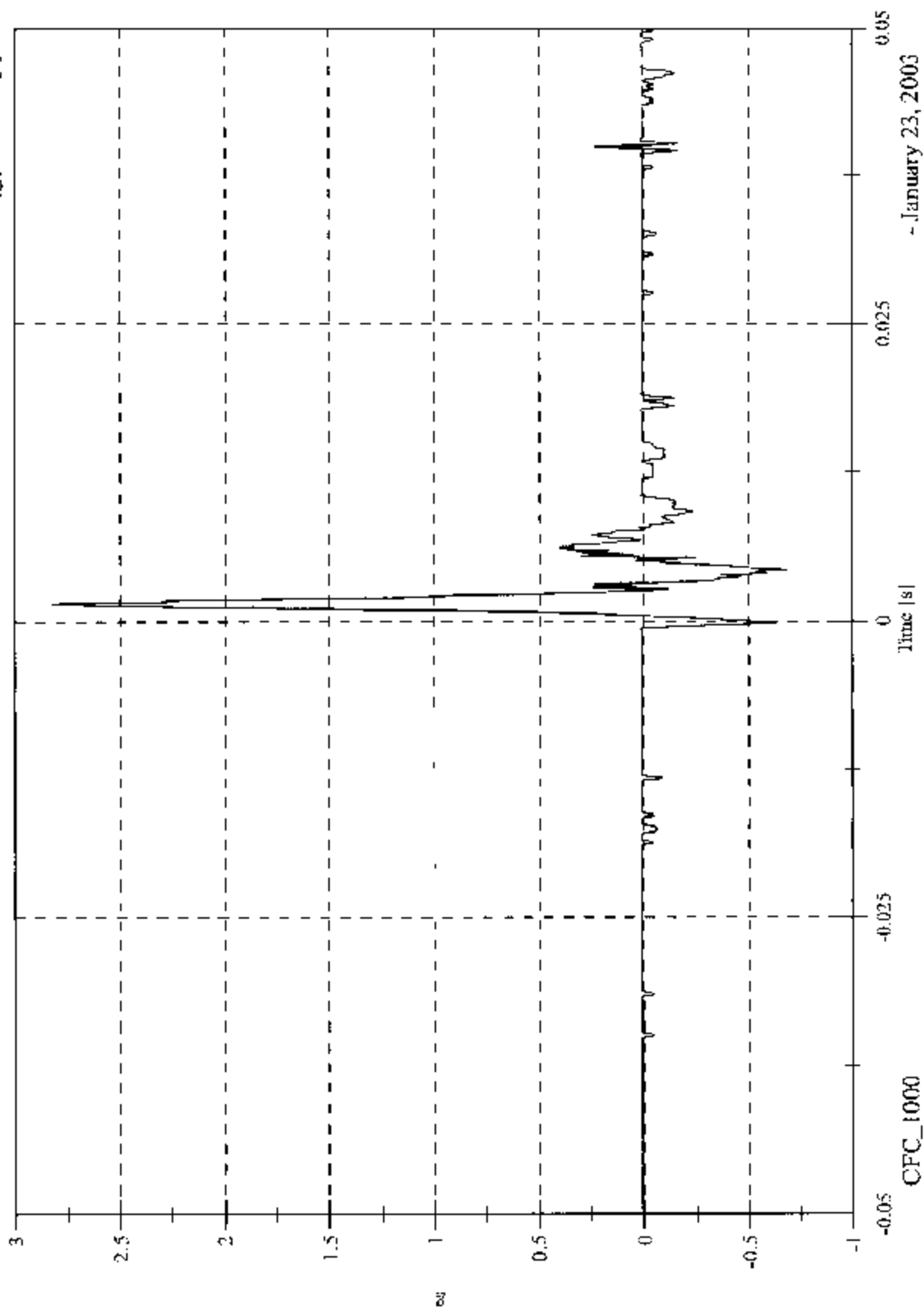


- January 23, 2003

FMVSS 201U - Head Form Calibration Drops

Max: 2.8 [g] at 0.001 [s]
Min: -0.7 [g] at 0.004 [s]

Headform Y Acceleration



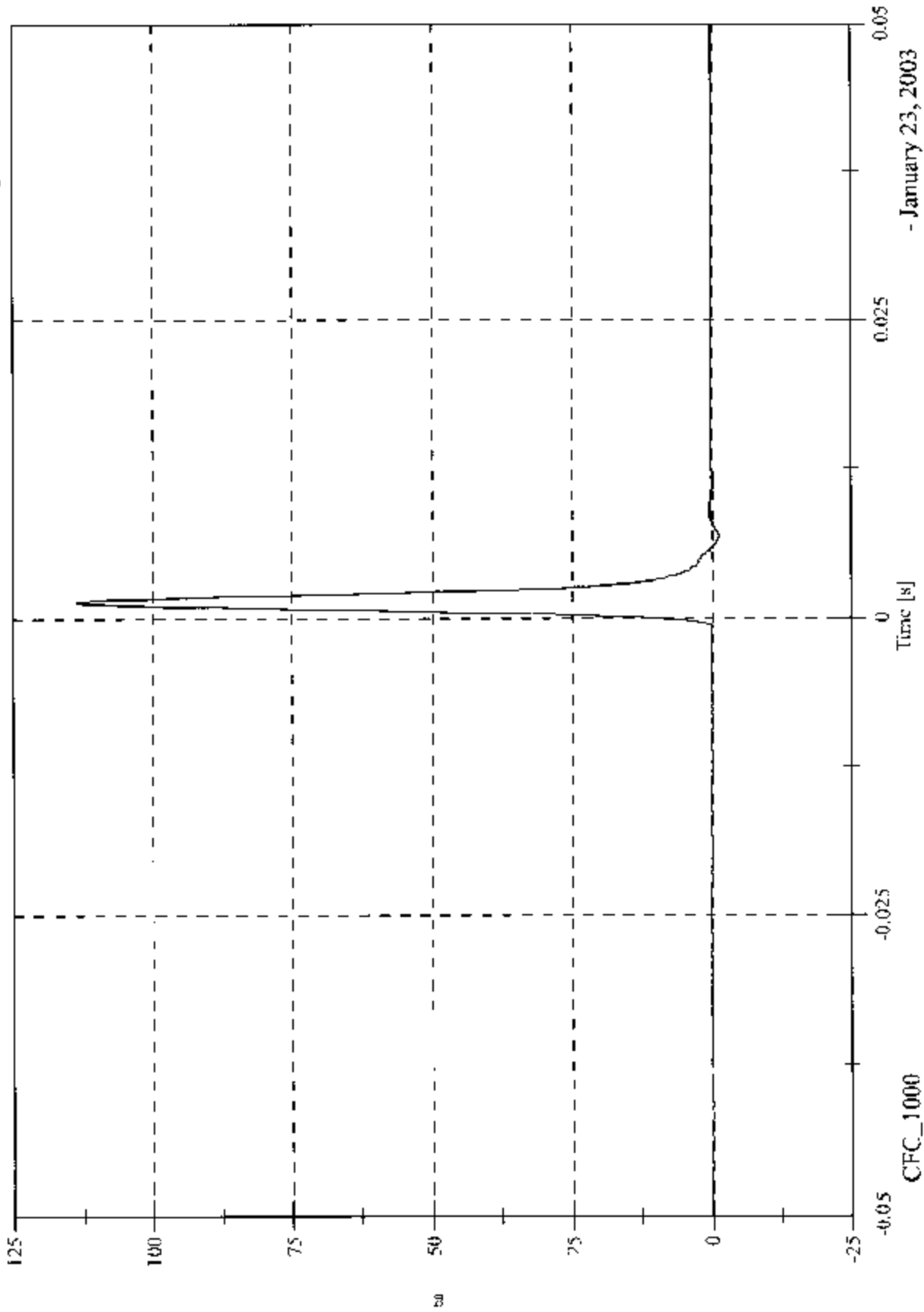
~ January 23, 2003

FMVSS 201U - Head Form Calibration Drops

Max: 113.7 [g] at 0.001 [s]

Min: -1.4 [g] at 0.007 [s]

Headform Z Acceleration

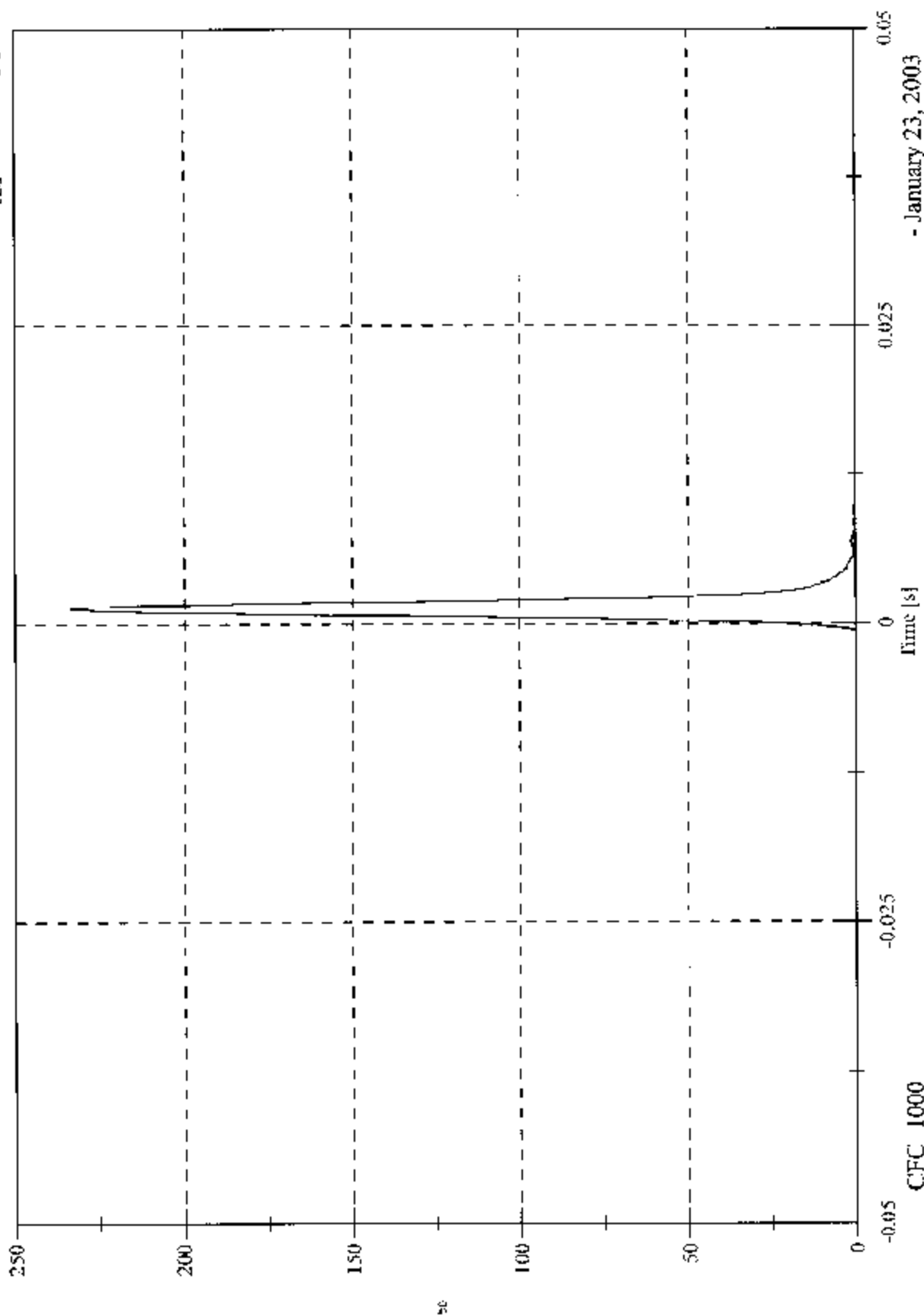


- January 23, 2003

FMVSS 201U - Head Form Calibration Drops

Max: 233.4 [g] at 0.001 [s]
Min: 0.0 [g] at -0.038 [s]

Headform Resultant



PART 572L
HEAD DROP PRE-TEST

MANUFACTURER:	APPLIED SAFETY TECHNOLOGIES CORPORATION	
SERIAL NUMBER:	1255	
CALIBRATION DATE:	January 23, 2003	
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	19°C to 26°C	21
RELATIVE HUMIDITY	10% to 70%	19
PEAK RESULTANT ACCELERATION	225 Gs to 275 Gs	268.3
PEAK LATERAL ACCELERATION	15 Gs Maximum	6.8
IS ACCELERATION CURVE UNIMODAL?	YES	YES

HEAD ACCELEROMETER CALIBRATION INFORMATION

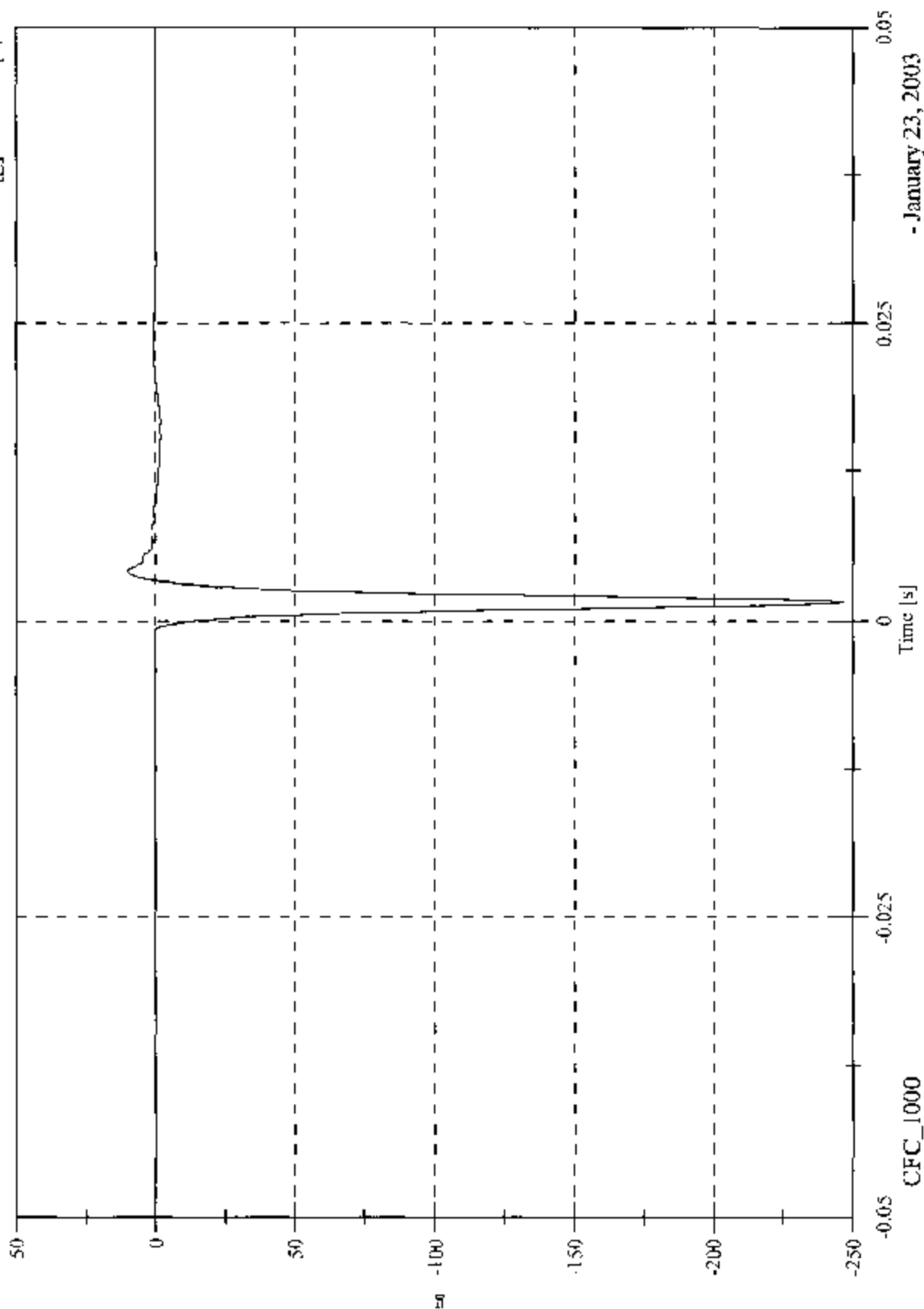
I.D. NUMBER	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	DATE OF LAST CALIBRATION	DATE OF NEXT CALIBRATION
1 - LONGITUDINAL	ENDEVCO	7264-2000T	J41006	9/02	3/03
2 - LATERAL	ENDEVCO	7264-2000T	J40994	9/02	3/03
3 - VERTICAL	ENDEVCO	7264-2000T	J41007	9/02	3/03

REMARKS:

FMVSS 201U - Head Form Calibration Drops

Headform X Acceleration

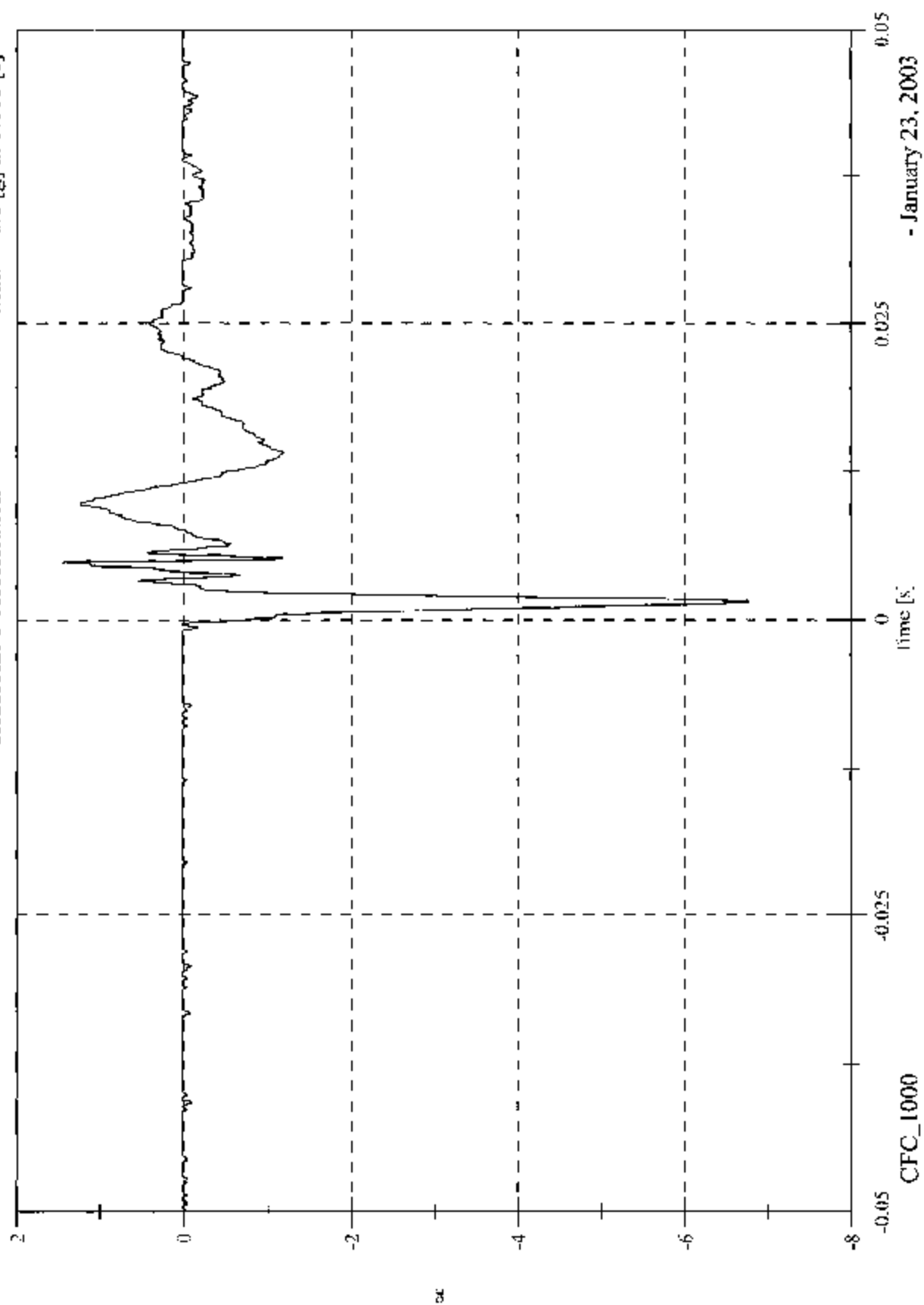
Max: 9.9 [g] at 0.004 [s]
Min: -246.7 [g] at 0.002 [s]



FMVSS 201C - Head Form Calibration Drops

Max: 1.5 [g] at 0.005 [s]
Min: -6.8 [g] at 0.001 [s]

Headform Y Acceleration



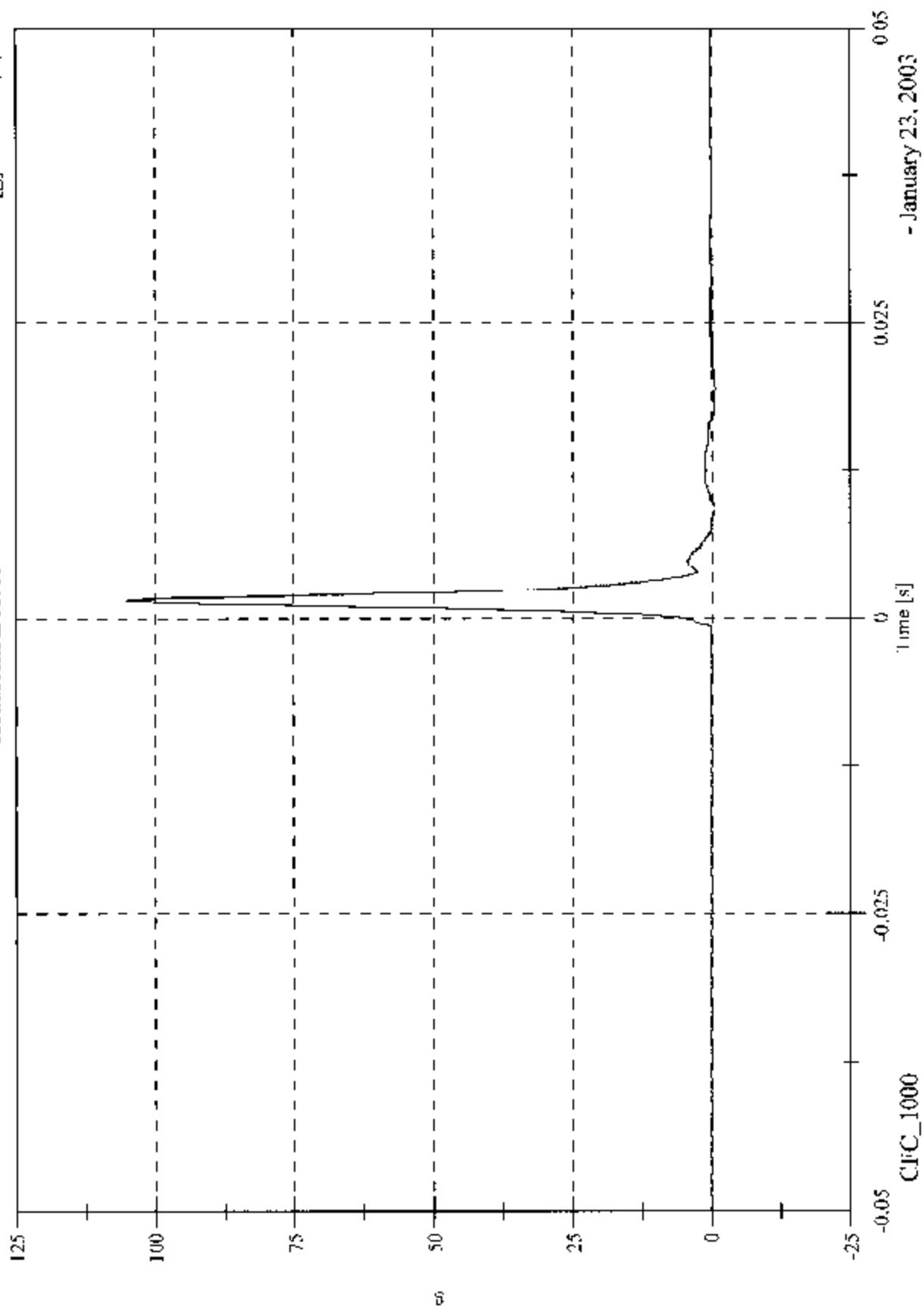
- January 23, 2003

FMVSS 201U - Head Form Calibration Drops

Max: 105.2 [g] at 0.002 [s]

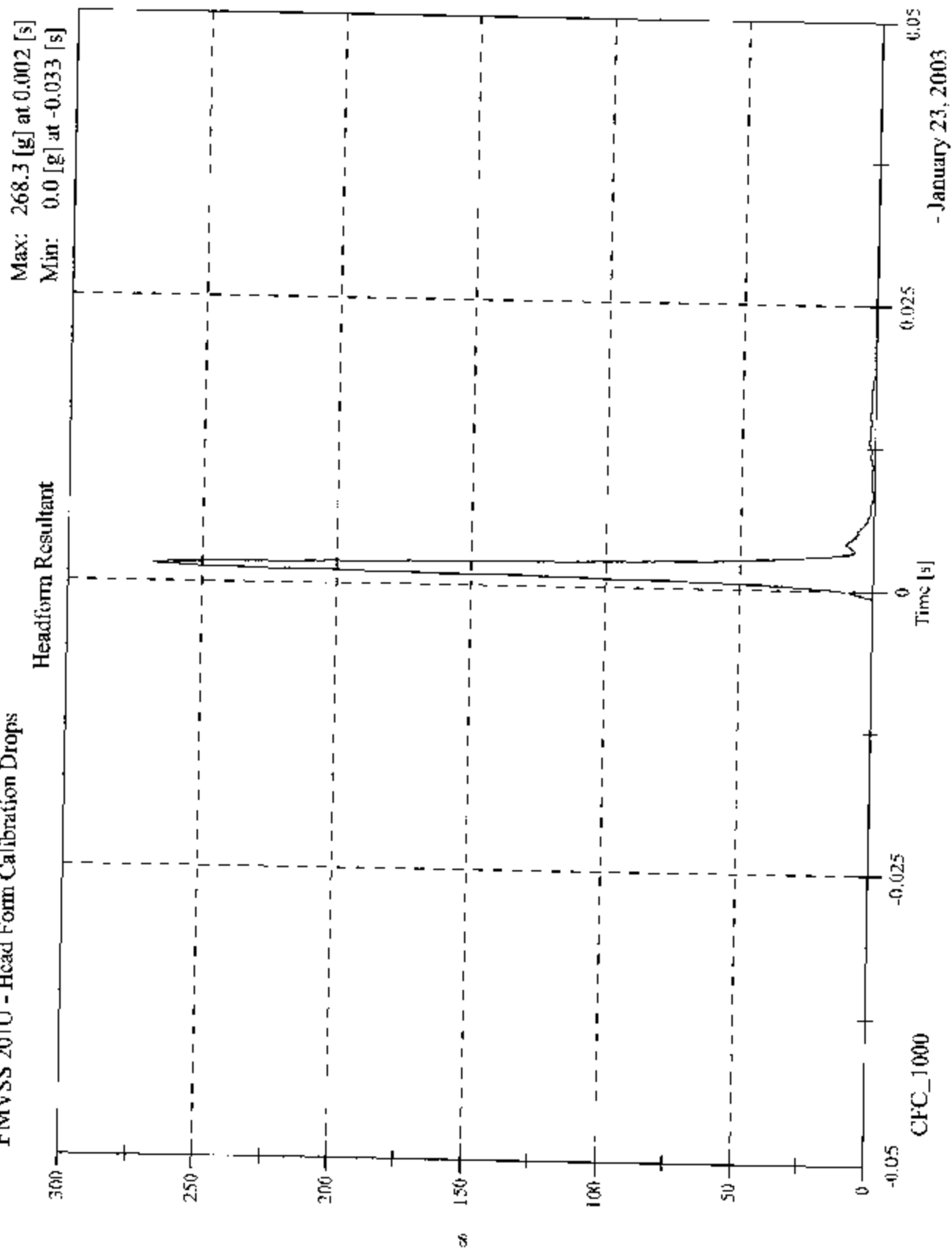
Min: -0.8 [g] at 0.019 [s]

Headform Z Acceleration



- January 23, 2003

FMVSS 2010 - Head Form Calibration Drops



PART 572L
HEAD DROP POST-TEST

MANUFACTURER:	FIRST TECHNOLOGIES SAFETY SYSTEMS	
SERIAL NUMBER:	0642	
CALIBRATION DATE:	January 30, 2003	
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	19°C to 26°C	23
RELATIVE HUMIDITY	10% to 70%	12
PEAK RESULTANT ACCELERATION	225 Gs to 275 Gs	256.3
PEAK LATERAL ACCELERATION	15 Gs Maximum	4.0
IS ACCELERATION CURVE UNIMODAL?	YES	YES

HEAD ACCELEROMETER CALIBRATION INFORMATION

I.D. NUMBER	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	DATE OF LAST CALIBRATION	DATE OF NEXT CALIBRATION
1 - LONGITUDINAL	ENDEVCO	7264-2000T	J24876	9/02	3/03
2 - LATERAL	ENDEVCO	7264-2000T	J33030	9/02	3/03
3 - VERTICAL	ENDEVCO	7264-2000T	J31009	9/02	3/03

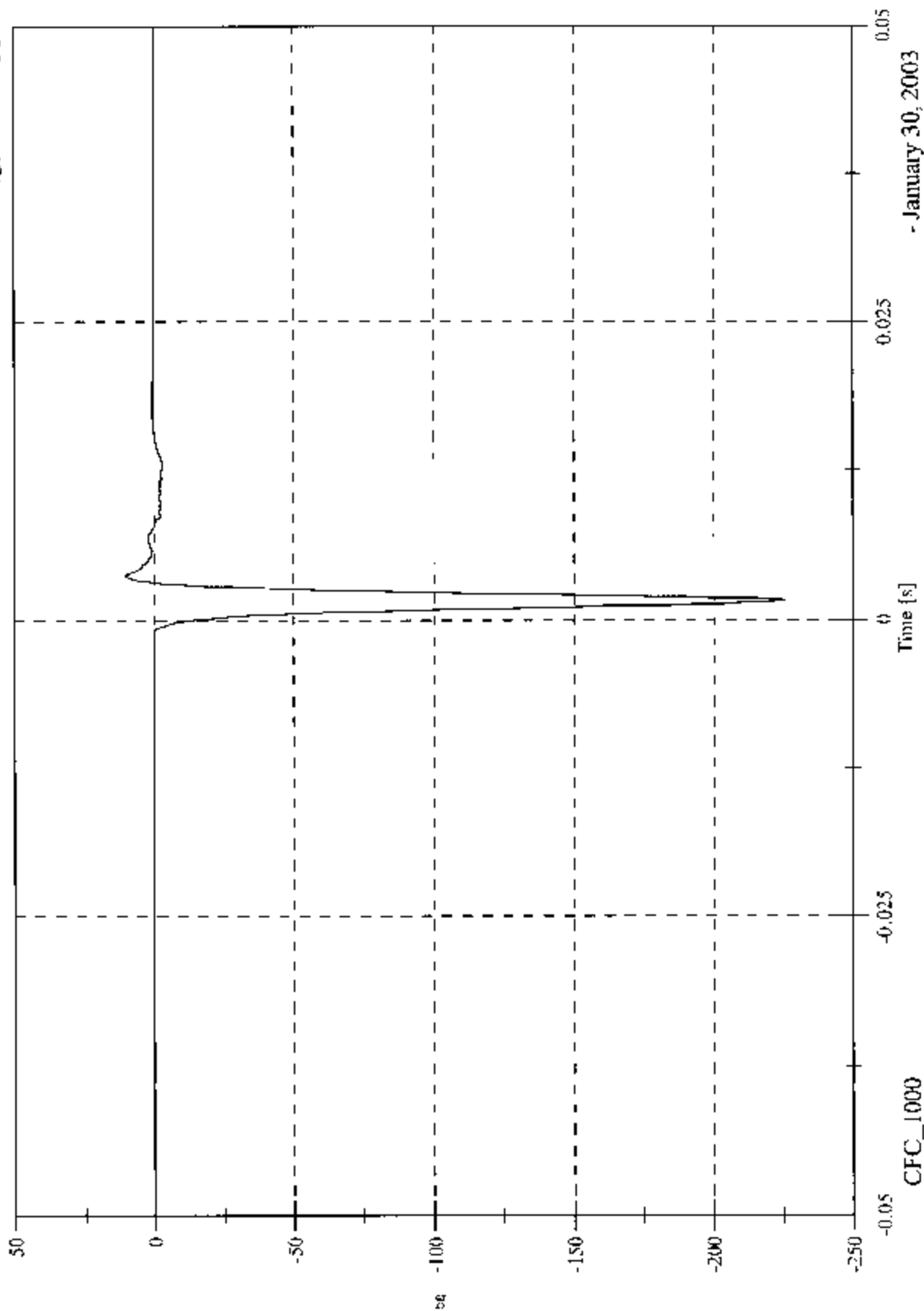
REMARKS:

FMVSS 201U - Head Form Calibration Drops

Headform X Acceleration

Max: 10.2 [g] at 0.004 [s]

Min: -225.7 [g] at 0.002 [s]

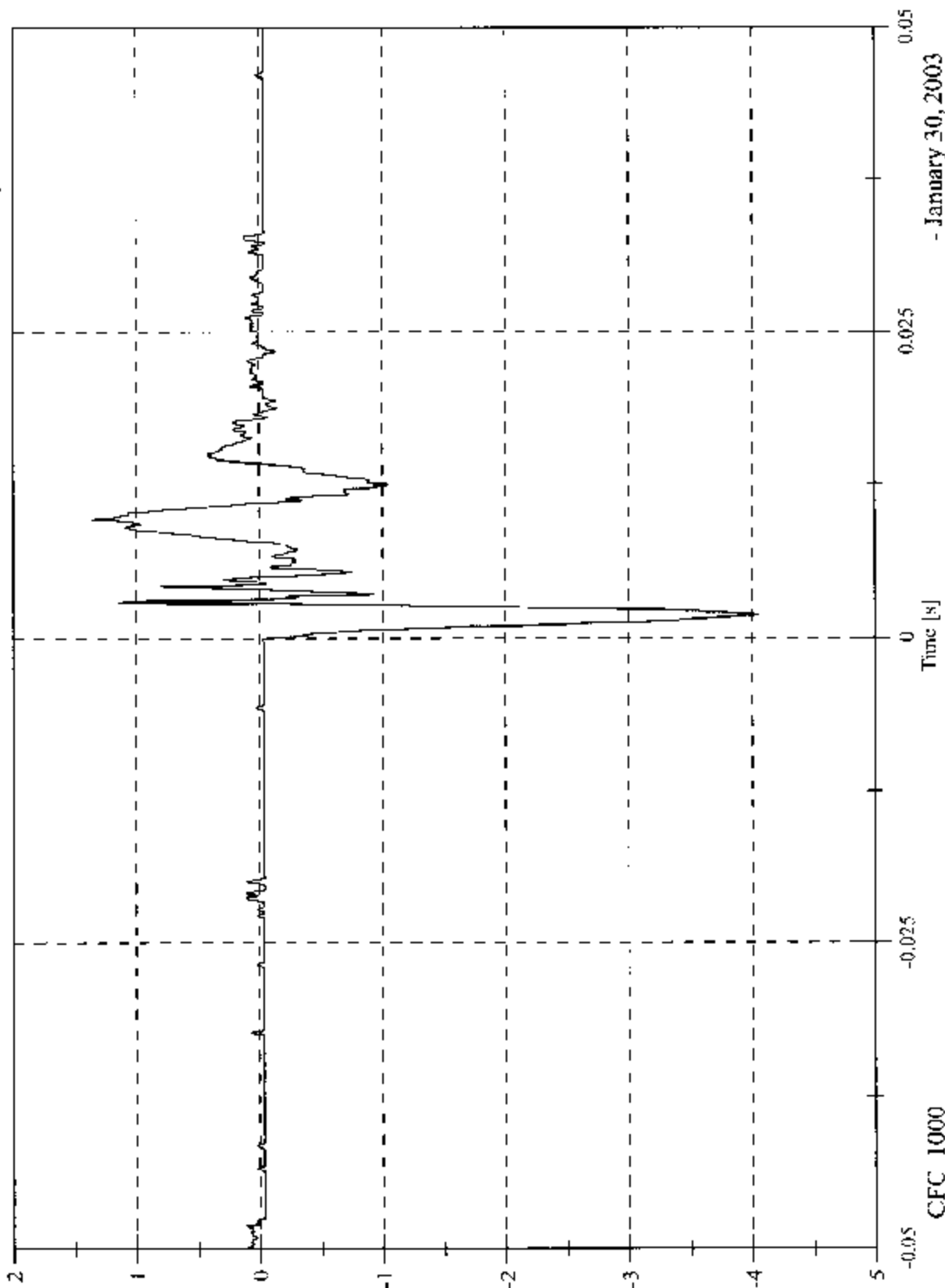


- January 30, 2003

FMVSS 201U - Head Form Calibration Drops

Max: 1.4 [g] at 0.010 [s]
Min: -4.0 [g] at 0.002 [s]

Headform Y Acceleration



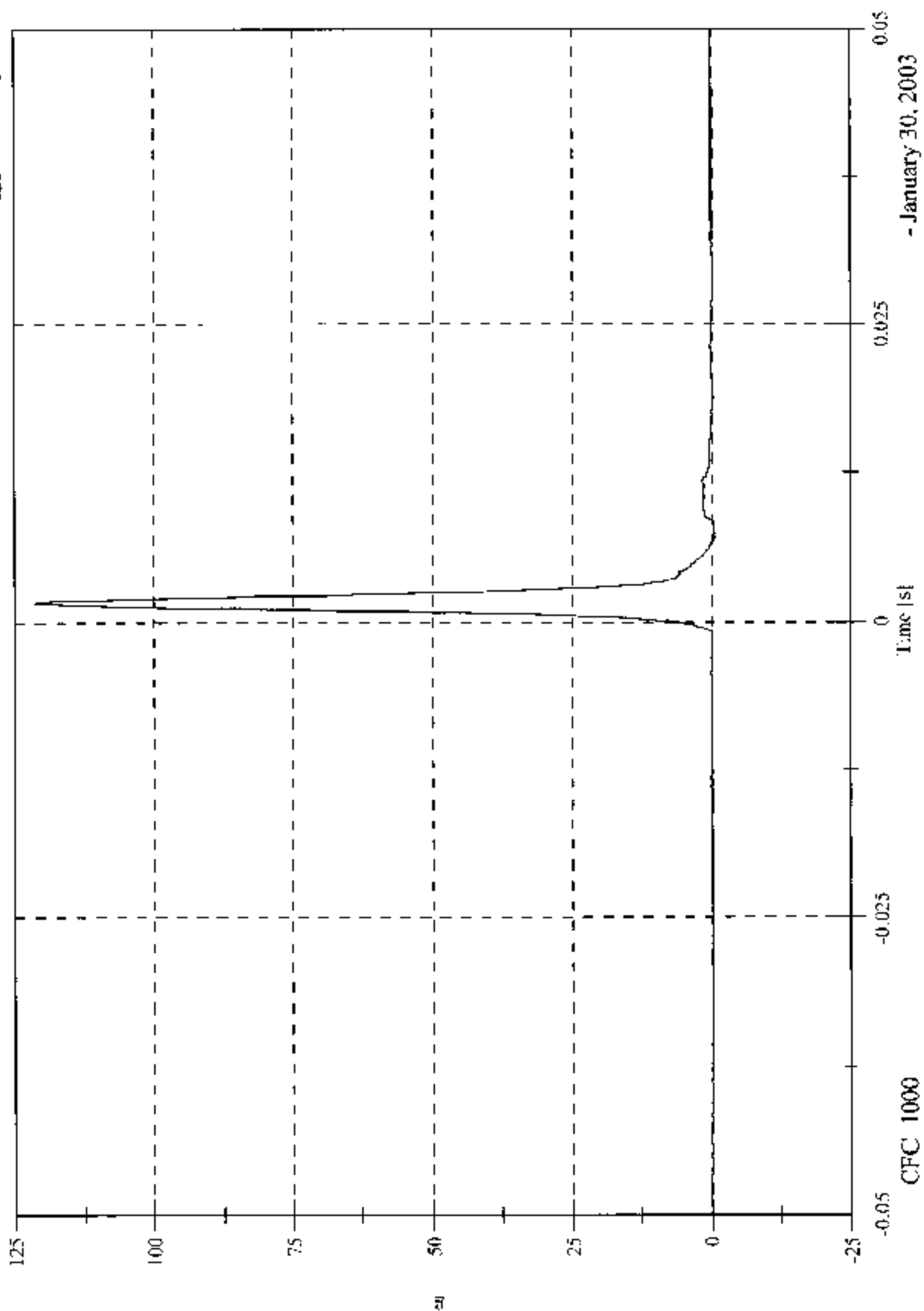
- January 30, 2003

FMVSS 201U - Head Form Calibration Drops

Max: 121.4 [g] at 0.002 [s]

Min: -0.6 [g] at 0.007 [s]

Headform Z Acceleration



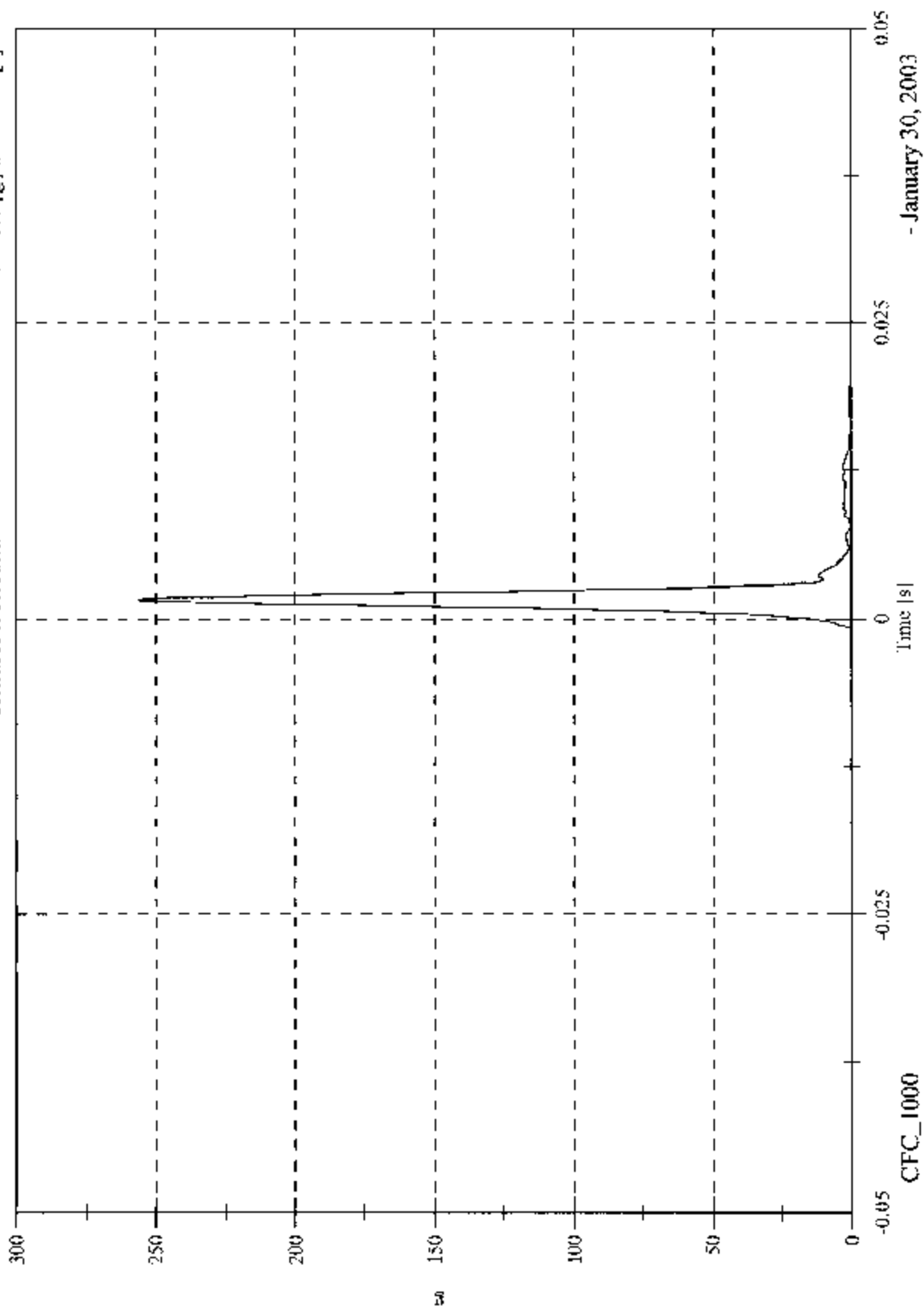
- January 30, 2003

FMVSS 201U - Head Form Calibration Drops

Max: 256.3 [g] at 0.002 [s]

Min: 0.0 [g] at -0.041 [s]

Headform Resultant



- January 30, 2003

PART 572L
HEAD DROP POST-TEST

MANUFACTURER:	FIRST TECHNOLOGIES SAFETY SYSTEMS	
SERIAL NUMBER:	805	
CALIBRATION DATE:	January 29, 2003	
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	19°C to 26°C	22
RELATIVE HUMIDITY	10% to 70%	14
PEAK RESULTANT ACCELERATION	225 Gs to 275 Gs	237.0
PEAK LATERAL ACCELERATION	15 Gs Maximum	4.3
IS ACCELERATION CURVE UNIMODAL?	YES	YES

HEAD ACCELEROMETER CALIBRATION INFORMATION

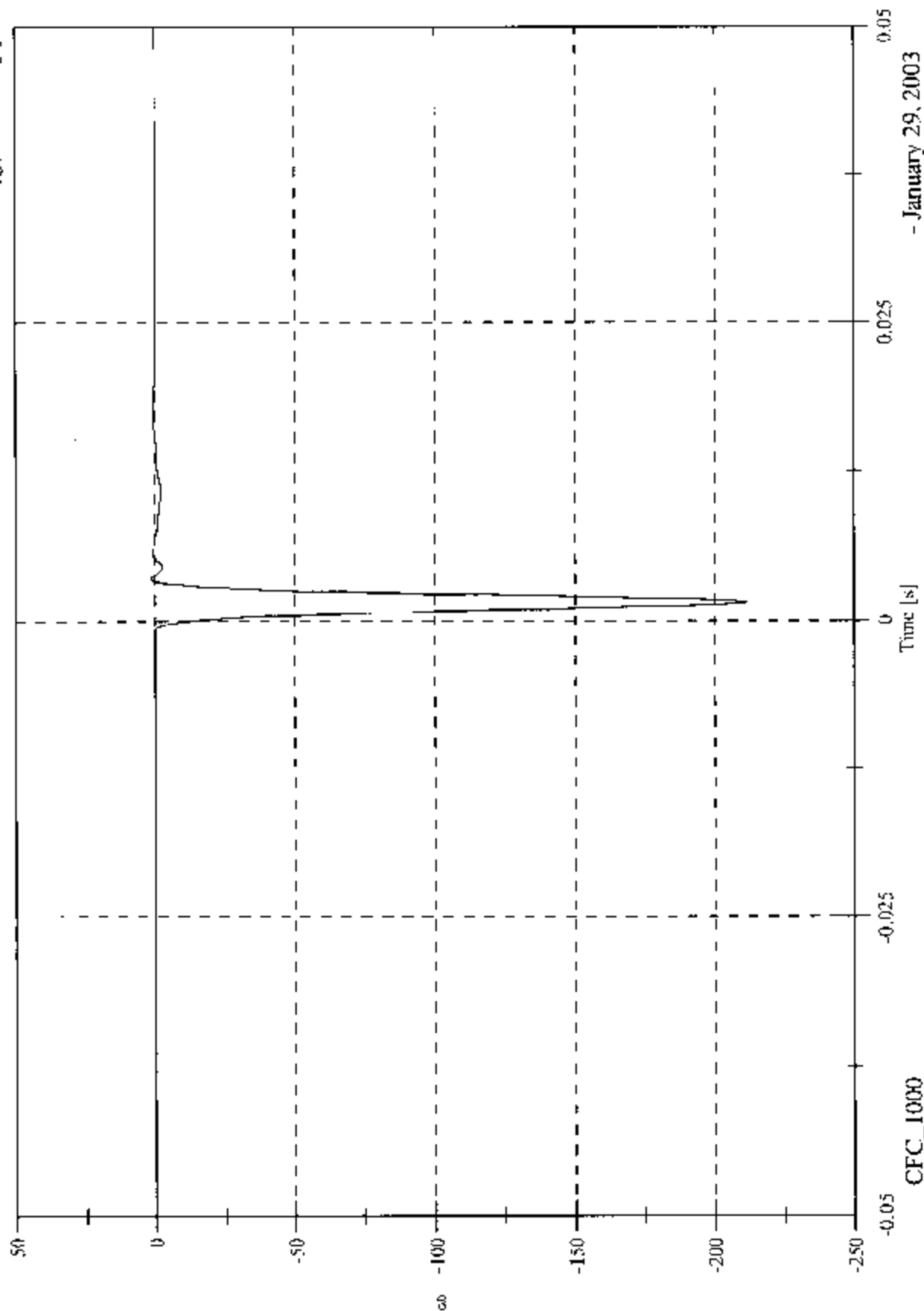
ID. NUMBER	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	DATE OF LAST CALIBRATION	DATE OF NEXT CALIBRATION
1 - LONGITUDINAL	ENDEVCO	7264-2000T	J38127	9/02	3/03
2 - LATERAL	ENDEVCO	7264-2000T	J37980	9/02	3/03
3 - VERTICAL	ENDEVCO	7264-2000T	J37854	9/02	3/03

REMARKS:

FMVSS 201U - Head Form Calibration Drops

Headform X Acceleration

Max: 1.6 [g] at 0.003 [s]
Min: -211.8 [g] at 0.001 [s]



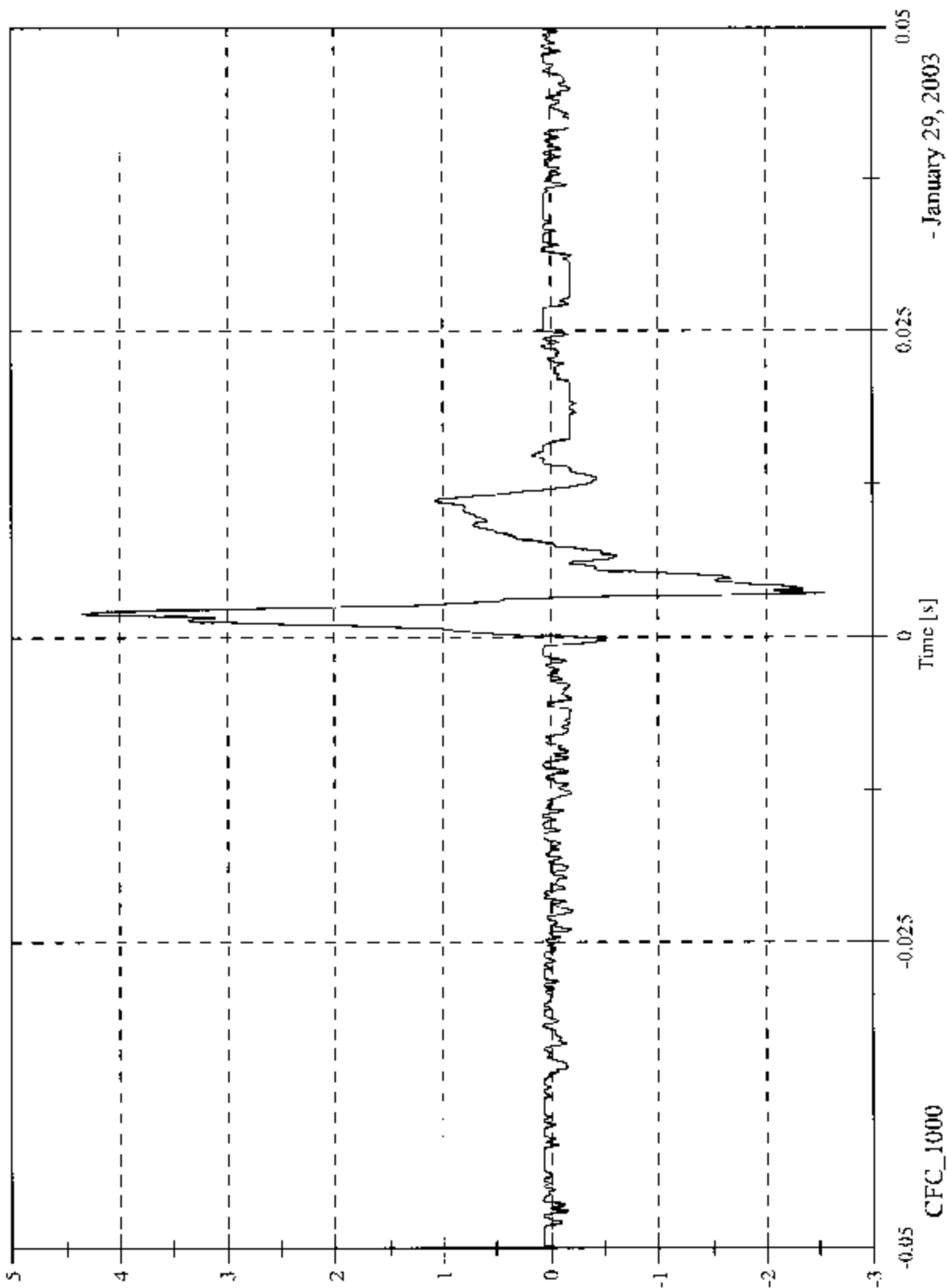
- January 29, 2003

FMVSS 201U - II Head Form Calibration Drops

Max: 4.3 [g] at 0.002 [s]

Min: -2.6 [g] at 0.003 [s]

Headform Y Acceleration



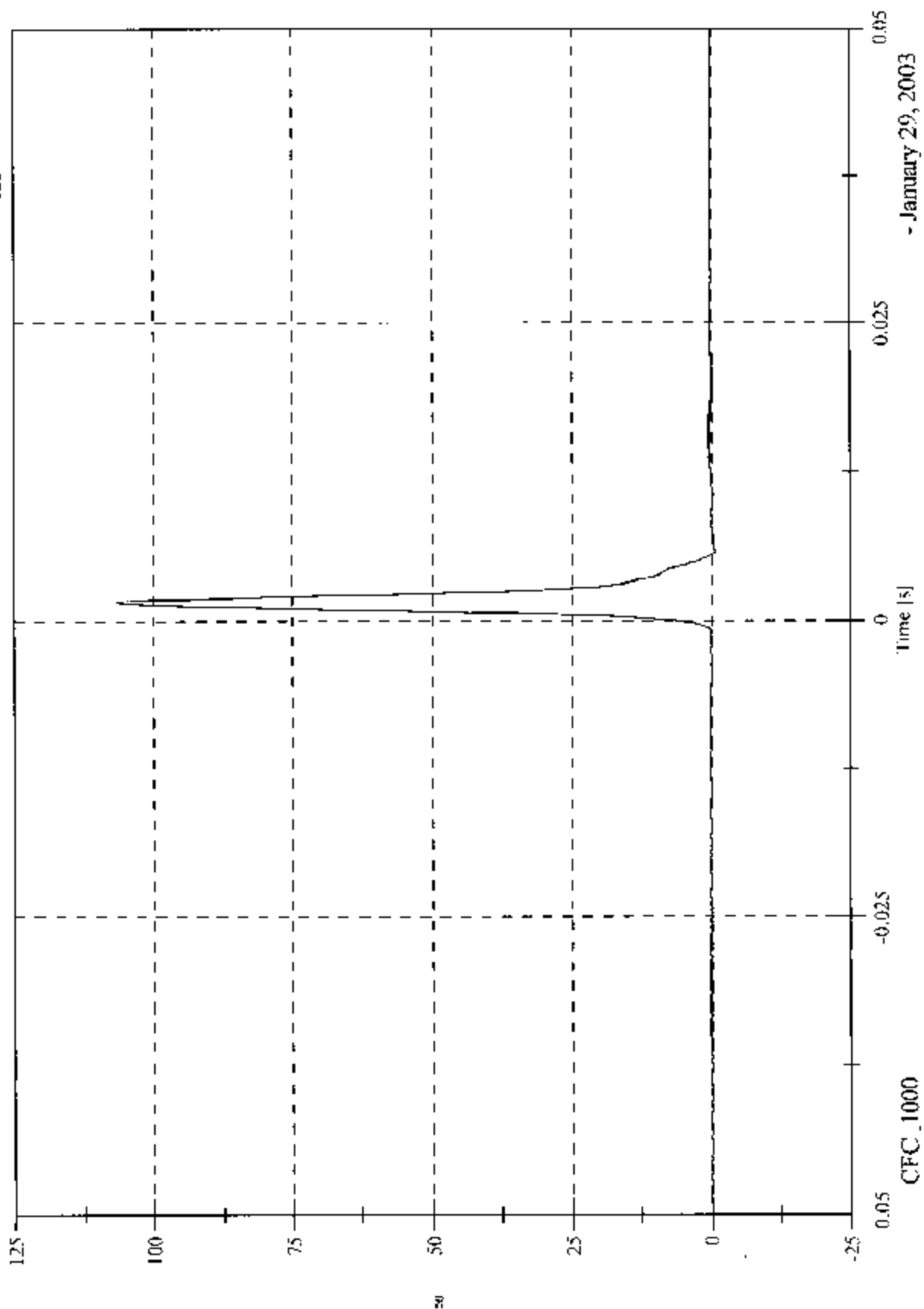
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Max: 106.7 [g] at 0.002 [s]

Min: -0.6 [g] at 0.006 [s]

FMVSS 201U - Head Form Calibration Drops

Headform Z Acceleration

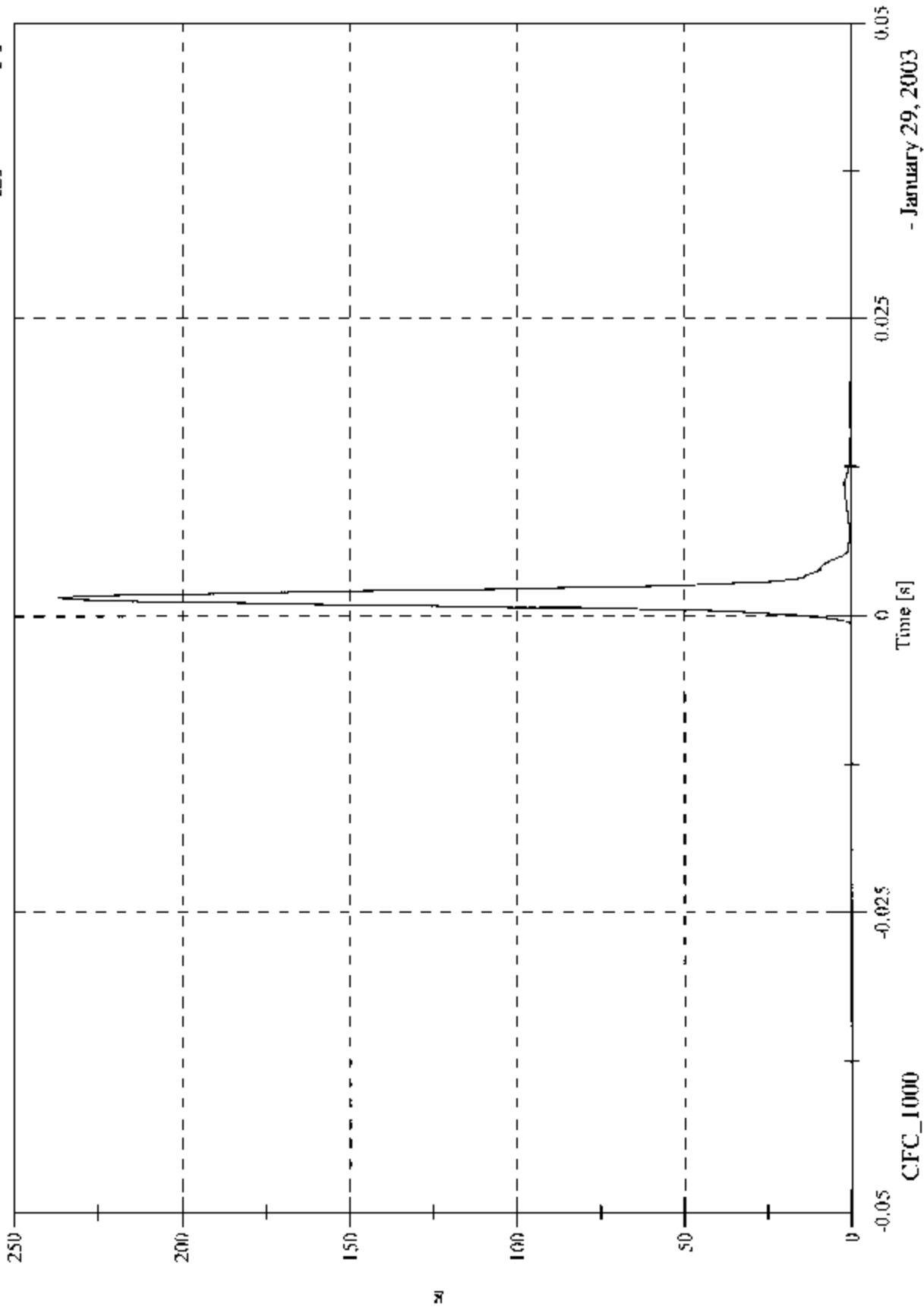


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FMVSS 201U - Head Form Calibration Drops

Max: 237.0 [g] at 0.001 [s]
Min: 0.0 [g] at -0.040 [s]

Headform Resultant



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PART 572L
HEAD DROP POST-TEST

MANUFACTURER:	APPLIED SAFETY TECHNOLOGIES CORPORATION	
SERIAL NUMBER:	0062	
CALIBRATION DATE:	January 30, 2003	
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	19°C to 26°C	23
RELATIVE HUMIDITY	10% to 70%	12
PEAK RESULTANT ACCELERATION	225 Gs to 275 Gs	258.1
PEAK LATERAL ACCELERATION	15 Gs Maximum	5.5
IS ACCELERATION CURVE UNIMODAL?	YES	YES

HEAD ACCELEROMETER CALIBRATION INFORMATION

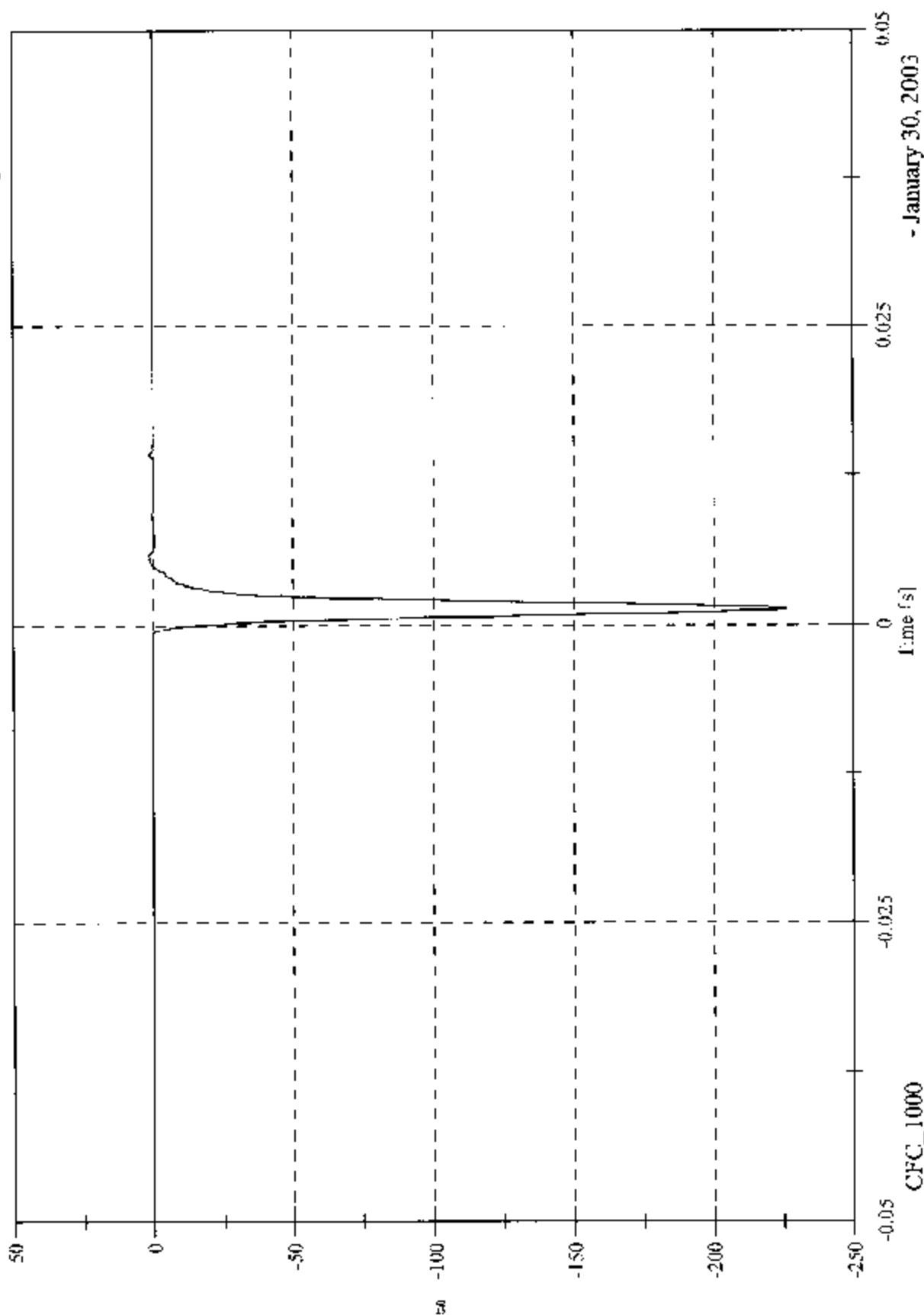
I.D. NUMBER	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	DATE OF LAST CALIBRATION	DATE OF NEXT CALIBRATION
1 - LONGITUDINAL	ENDEVCO	7264-2000T	J33127	9/02	3/03
2 - LATERAL	ENDEVCO	7264-2000T	J33019	9/02	3/03
3 - VERTICAL	ENDEVCO	7264-2000T	J32782	9/02	3/03

REMARKS:

FMVSS 201U - Head Form Calibration Drops

Max: 1.5 [g] at 0.014 [s]
Min: -225.8 [g] at 0.001 [s]

Headform X Acceleration

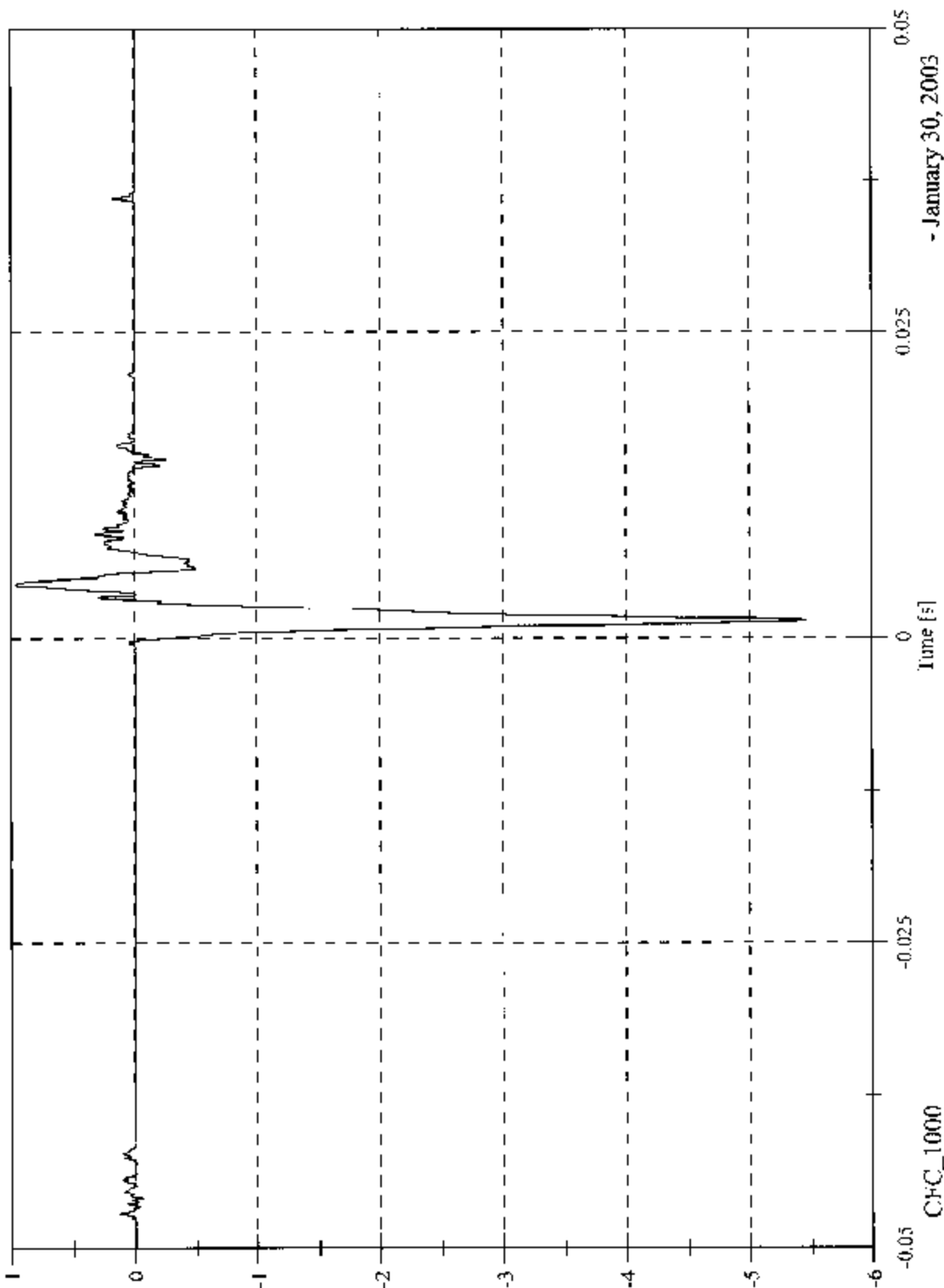


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FMVSS 201U - Head Form Calibration Drops

Max: 1.0 [g] at 0.004 [s]
Min: -5.5 [g] at 0.001 [s]

Headform Y Acceleration

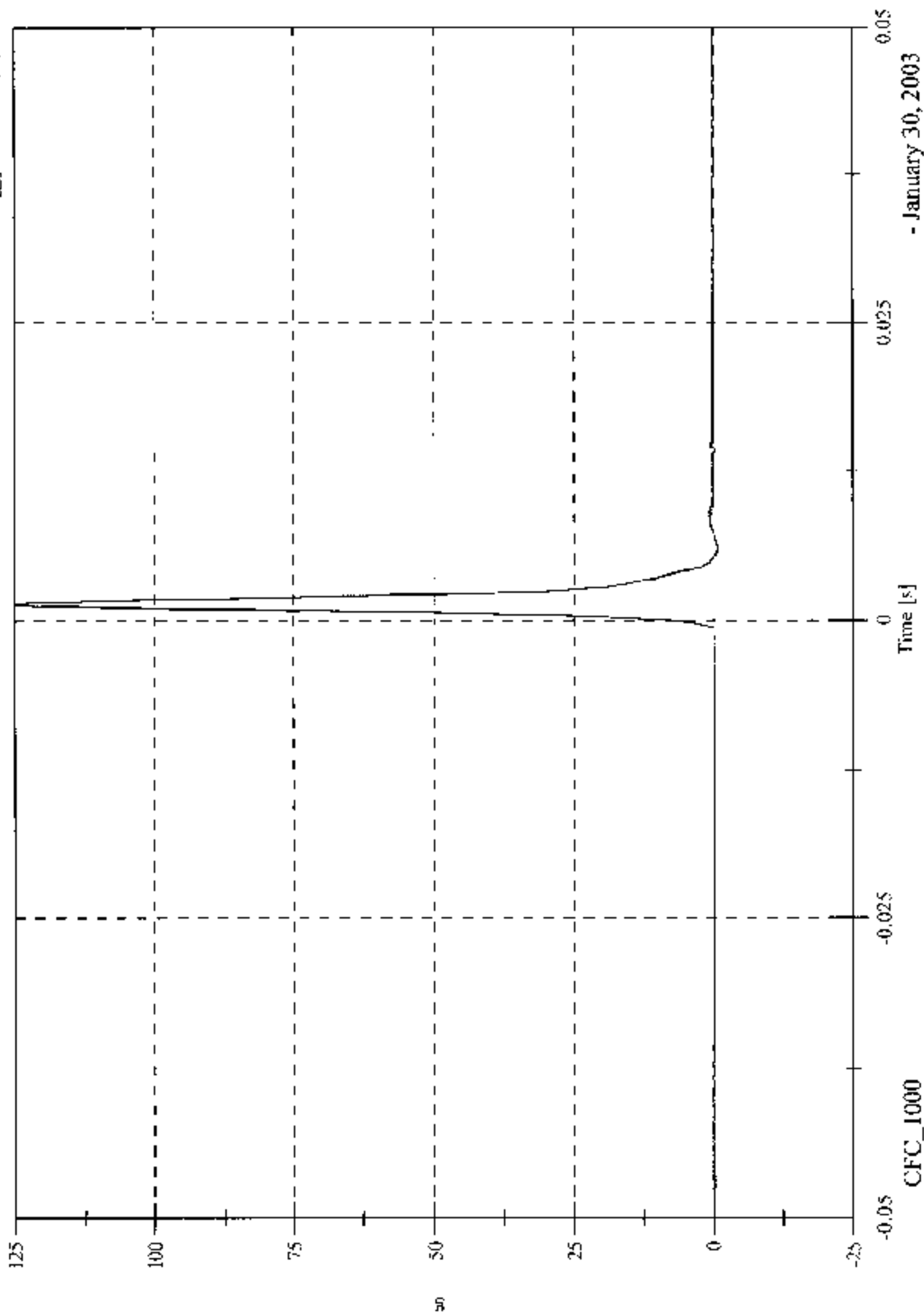


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FMVSS 201U - Head Form Calibration Drops

Headform Z Acceleration

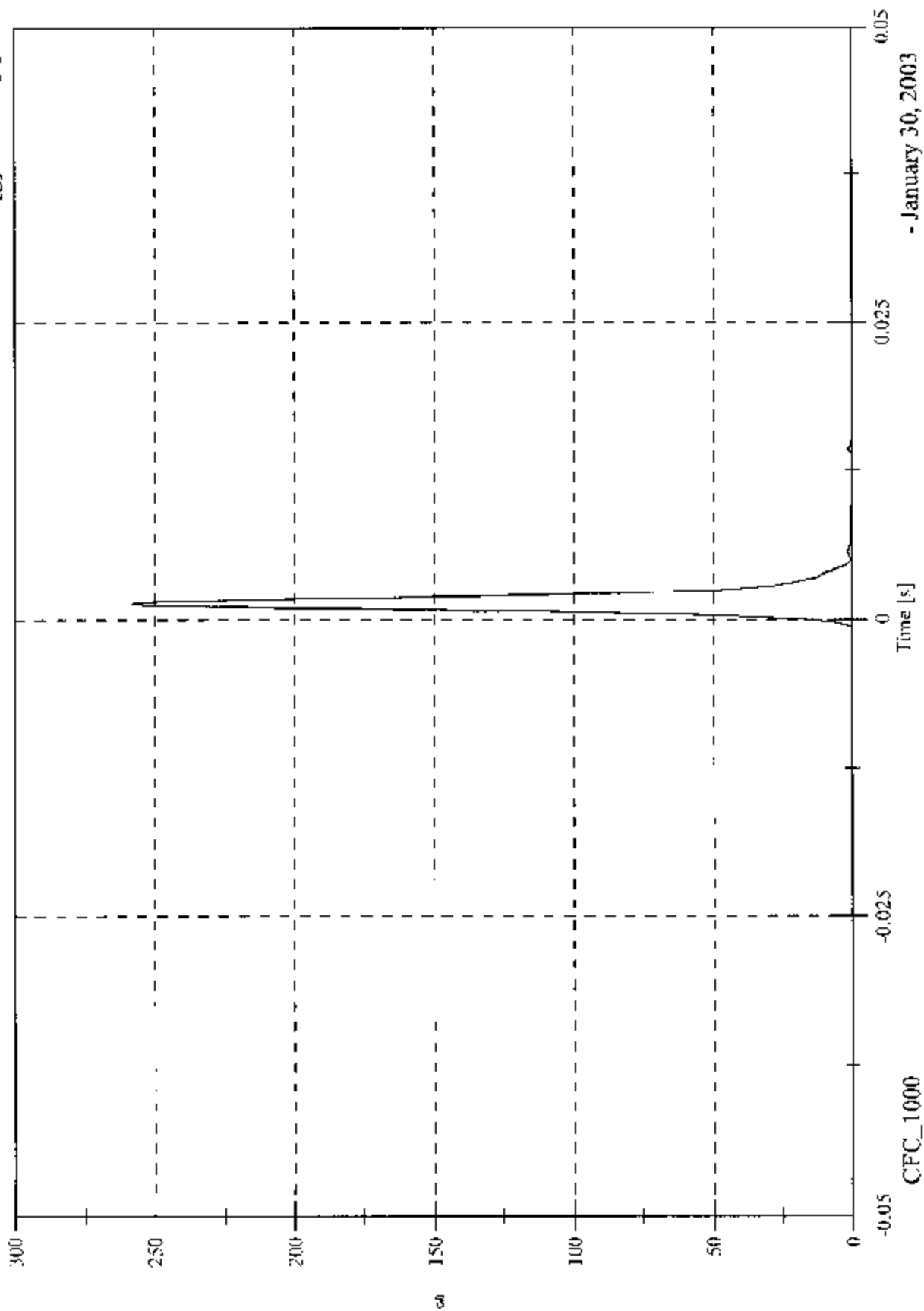
Max: 124.9 [g] at 0.001 [s]
Min: -0.9 [g] at 0.006 [s]



FMVSS 201U - Head Form Calibration Drops

Max: 258.1 [g] at 0.001 [s]
Min: 0.0 [g] at 0.041 [s]

Headform Resultant



PART 572L
HEAD DROP POST-TEST

MANUFACTURER:	APPLIED SAFETY TECHNOLOGIES CORPORATION	
SERIAL NUMBER:	0355	
CALIBRATION DATE:	January 30, 2003	
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	19°C to 26°C	23
RELATIVE HUMIDITY	10% to 70%	12
PEAK RESULTANT ACCELERATION	225 Gs to 275 Gs	231.0
PEAK LATERAL ACCELERATION	15 Gs Maximum	11.0
IS ACCELERATION CURVE UNIMODAL?	YES	YES

HEAD ACCELEROMETER CALIBRATION INFORMATION

ID. NUMBER	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	DATE OF LAST CALIBRATION	DATE OF NEXT CALIBRATION
1 - LONGITUDINAL	ENDEVCO	7264-2000T	J28671	9/02	3/03
2 - LATERAL	ENDEVCO	7264-2000T	J32779	9/02	3/03
3 - VERTICAL	ENDEVCO	7264-2000T	J25854	9/02	3/03

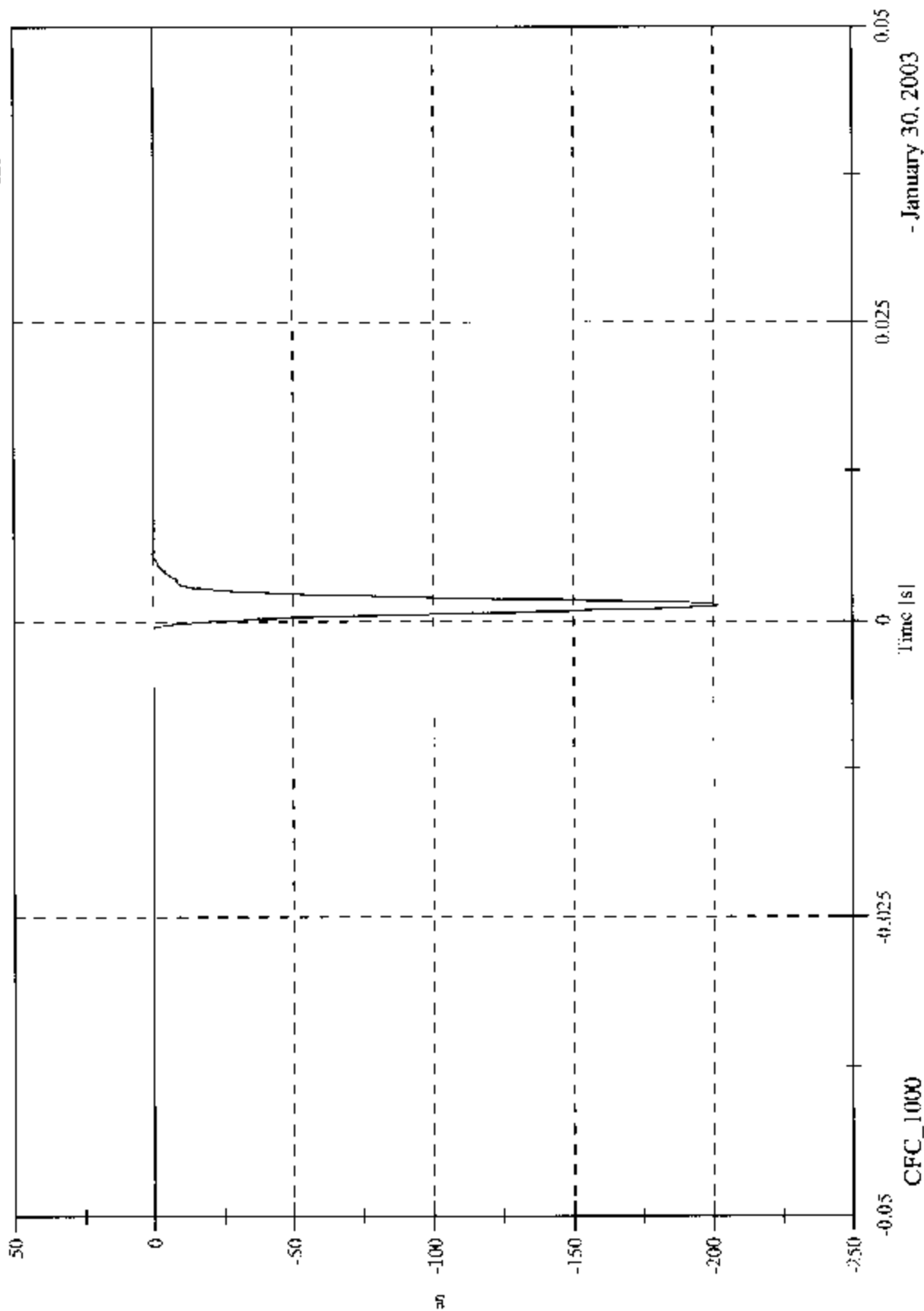
REMARKS:

FMVSS 201U - Head Form Calibration Drops

Headform X Acceleration

Max: 0.5 [g] at 0.006 [s]

Min: -201.7 [g] at 0.001 [s]



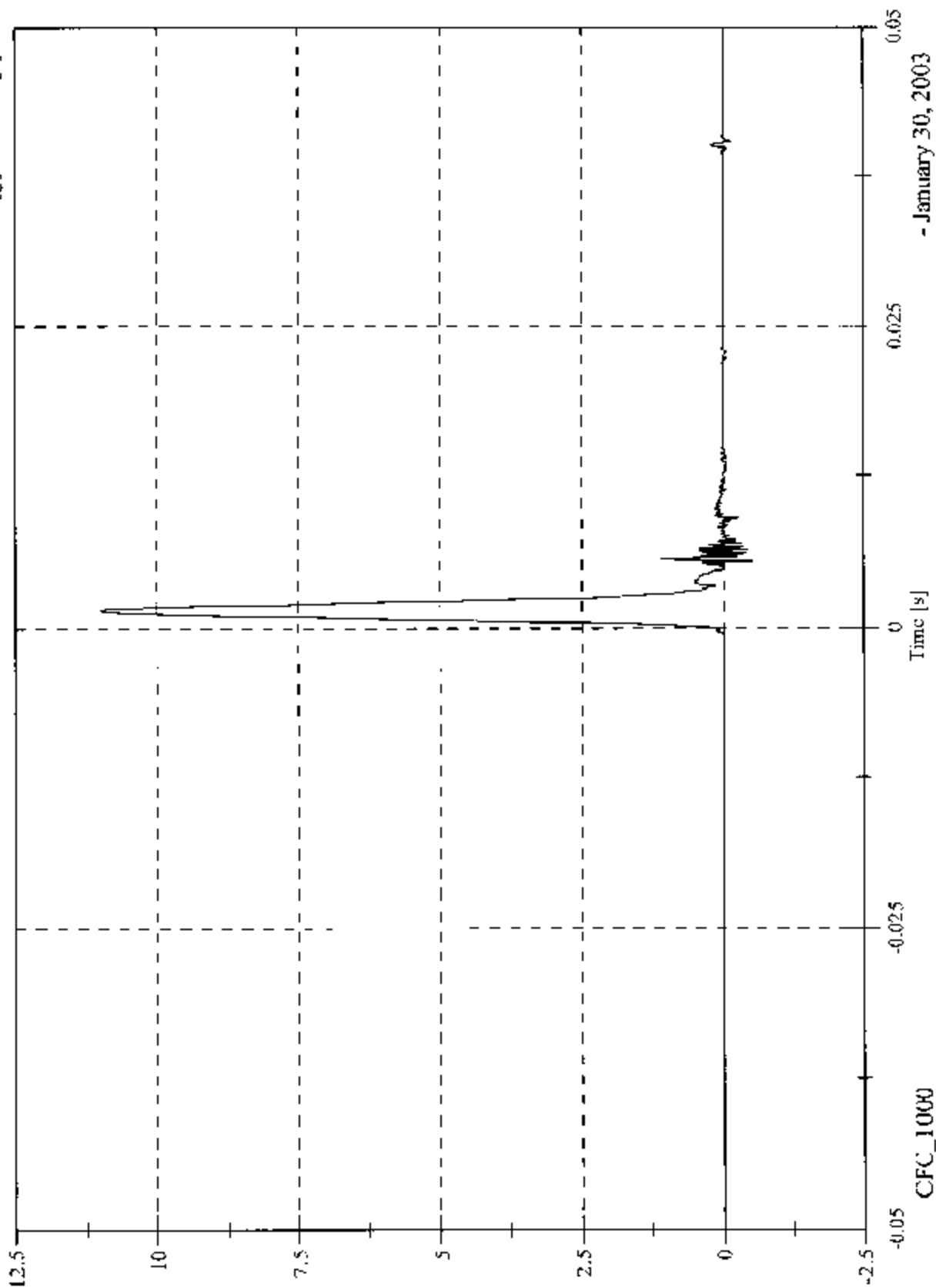
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FMVSS 201U - Head Form Calibration Drops

Max: 11.0 [g] at 0.001 [s]

Min: -0.5 [g] at 0.005 [s]

Headform Y Acceleration



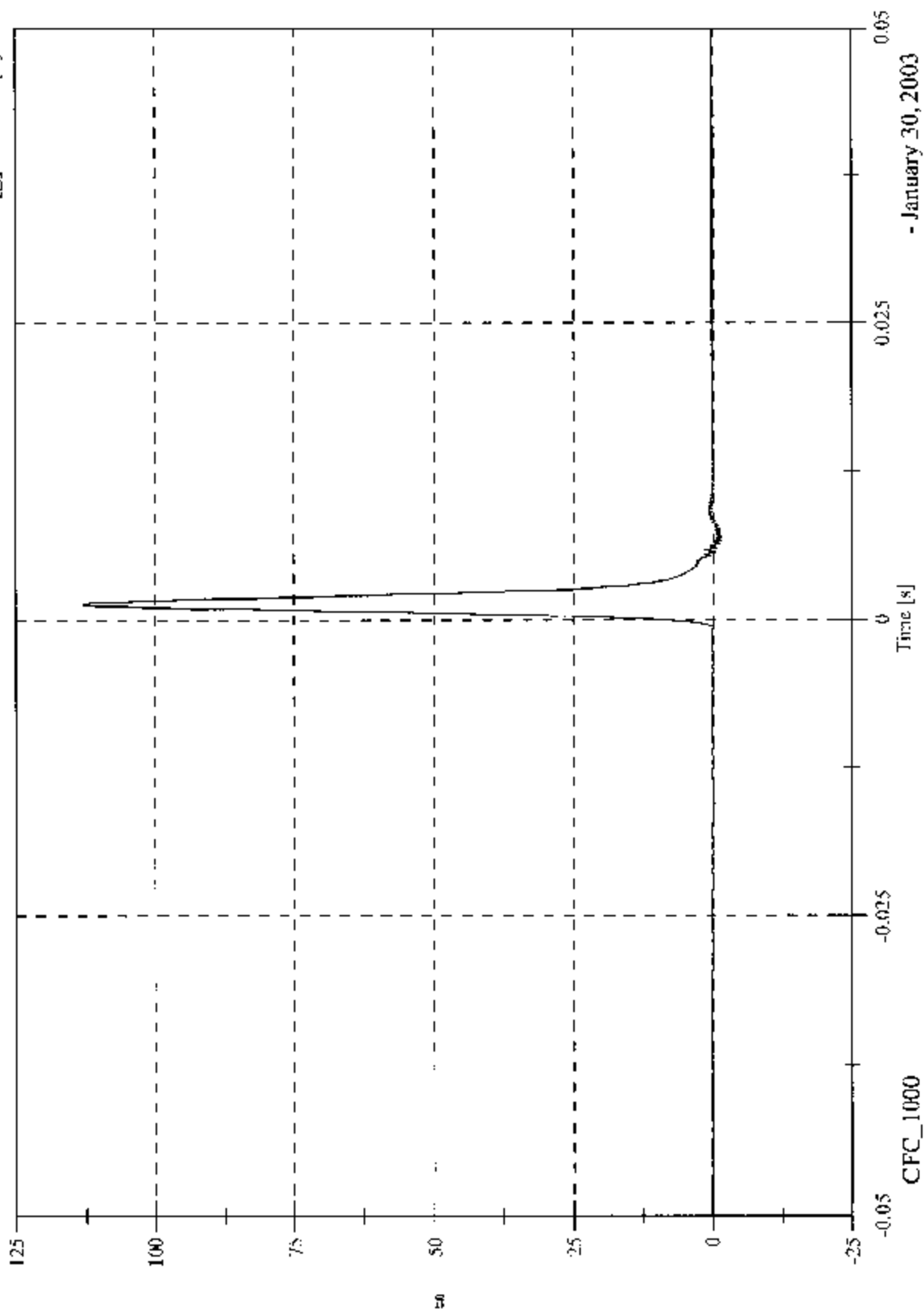
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FMVSS 201U - Head Form Calibration Drops

Max: 112.8 [g] at 0.001 [s]

Min: -1.6 [g] at 0.007 [s]

Headform 7: Acceleration

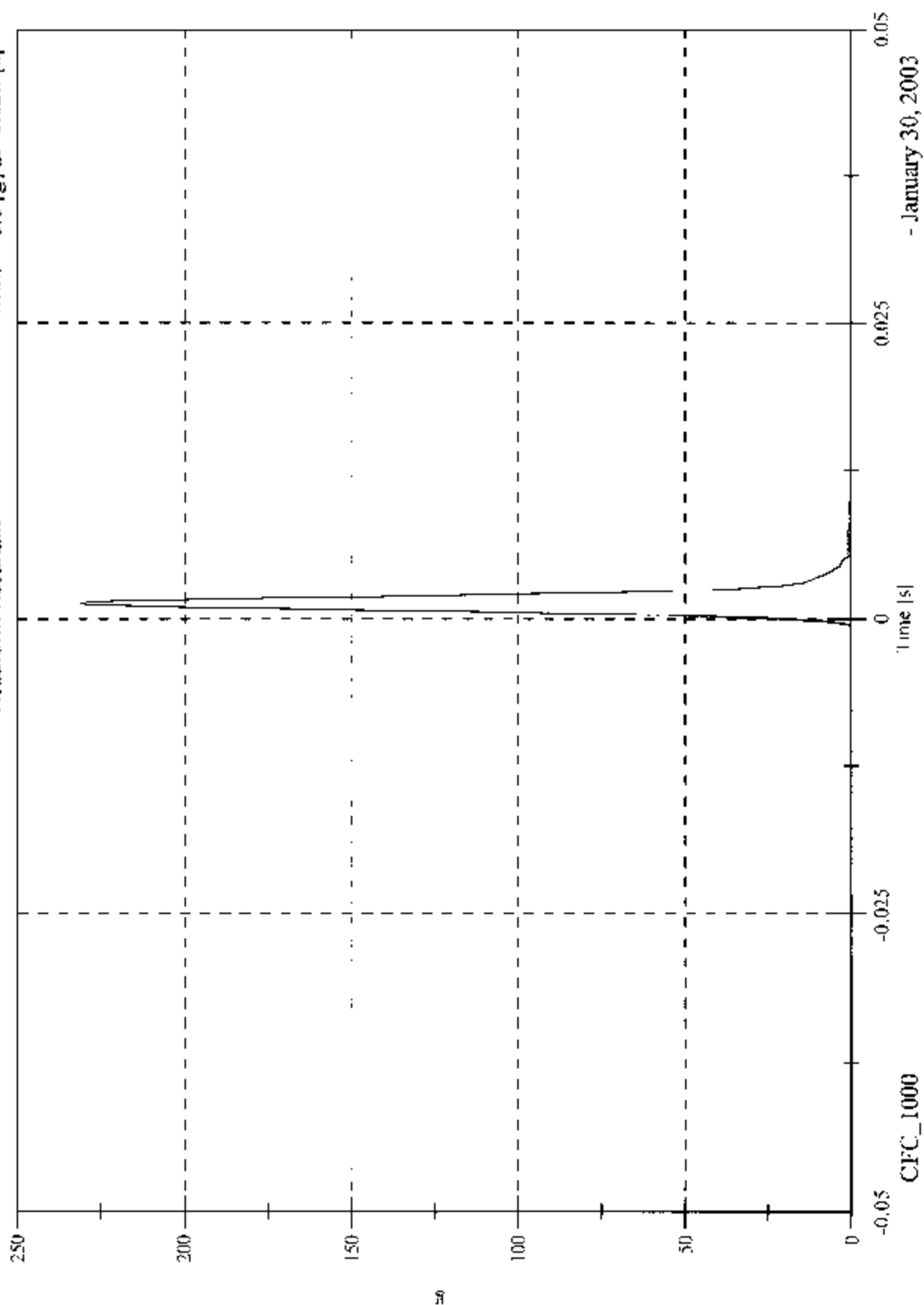


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FMVSS 201U - Head Form Calibration Drops

Max: 231.0 [g] at 0.001 [s]
Min: 0.0 [g] at -0.028 [s]

Headform Resultant



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**PART 572L
HEAD DROP POST-TEST**

MANUFACTURER:	APPLIED SAFETY TECHNOLOGIES CORPORATION	
SERIAL NUMBER:	1255	
CALIBRATION DATE:	January 30, 2003	
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	19°C to 26°C	23
RELATIVE HUMIDITY	10% to 70%	12
PEAK RESULTANT ACCELERATION	225 Gs to 275 Gs	274.0
PEAK LATERAL ACCELERATION	15 Gs Maximum	6.7
IS ACCELERATION CURVE UNIMODAL?	YES	YES

HEAD ACCELEROMETER CALIBRATION INFORMATION

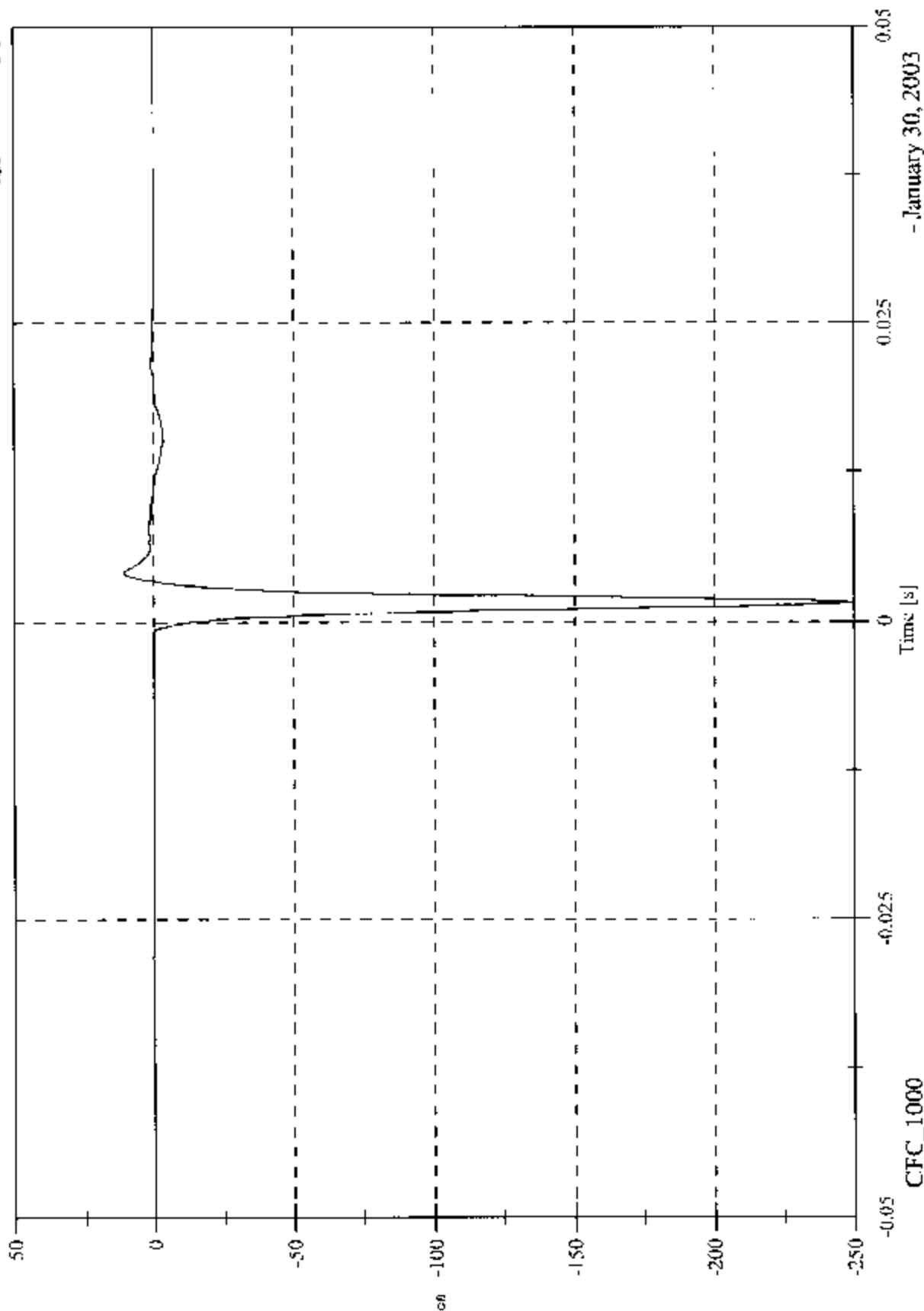
I.D. NUMBER	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	DATE OF LAST CALIBRATION	DATE OF NEXT CALIBRATION
1 - LONGITUDINAL	ENDEVCO	7264-2000T	J41006	9/02	3/03
2 - LATERAL	ENDEVCO	7264-2000T	J40994	9/02	3/03
3 - VERTICAL	ENDEVCO	7264-2000T	J41007	9/02	3/03

REMARKS:

FMVSS 201C - Head Form Calibration Drops

Headform X Acceleration

Max: 10.8 [g] at 0.004 [s]
Min: -249.6 [g] at 0.002 [s]

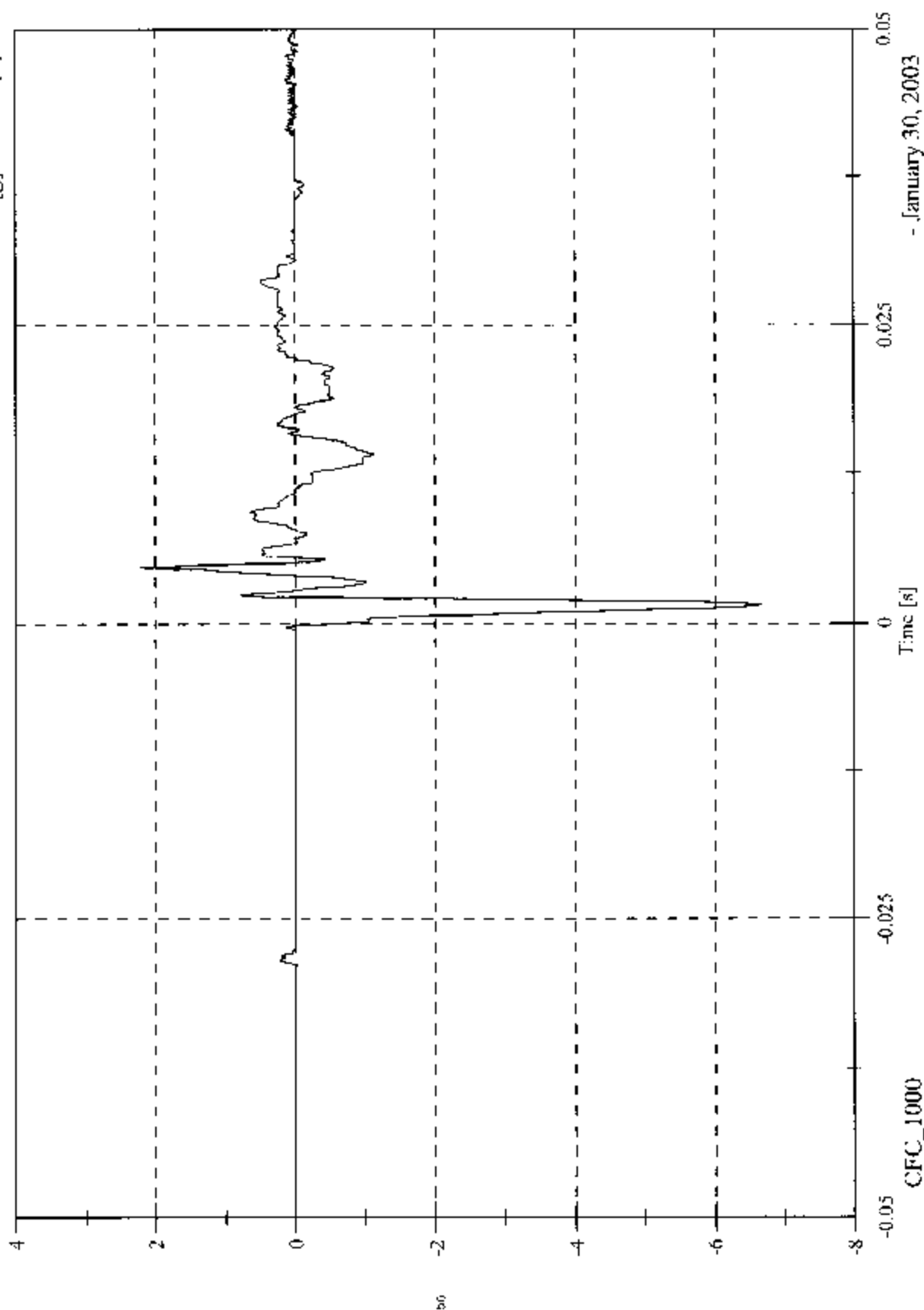


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FMVSS 201U - Head Form Calibration Drops

Headform Y Acceleration

Max: 2.2 [g] at 0.005 [s]
Min: -6.7 [g] at 0.001 [s]

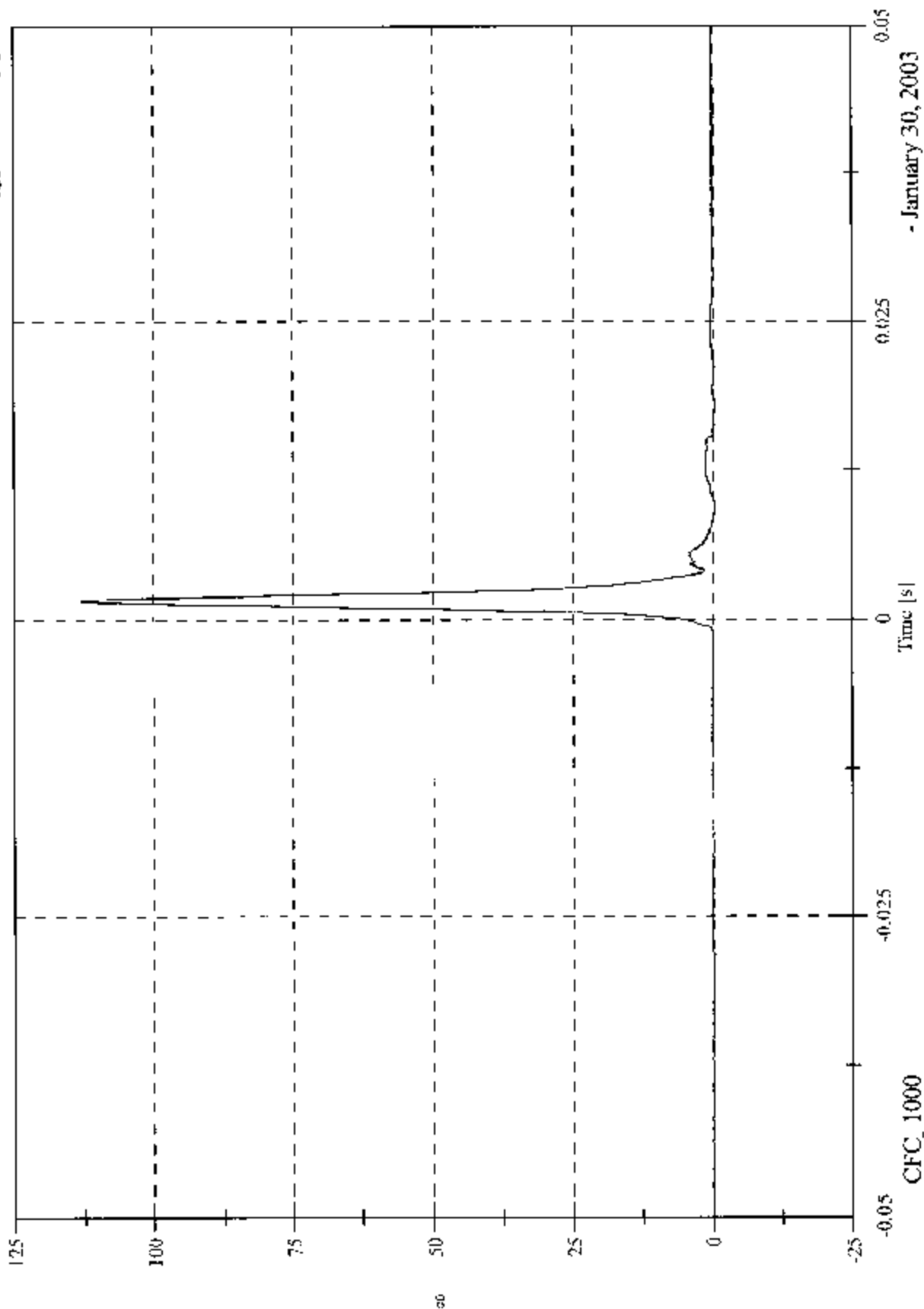


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FMVSS 201U - Head Form Calibration Drops

Headform Z Acceleration

Max: 113.0 [g] at 0.002 [s]
Min: -0.4 [g] at 0.018 [s]



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FMVSS 201U - Head Form Calibration Drops

Max: 274.0 [g] at 0.002 [s]
Min: 0.0 [g] at -0.037 [s]

Headform Resultant

